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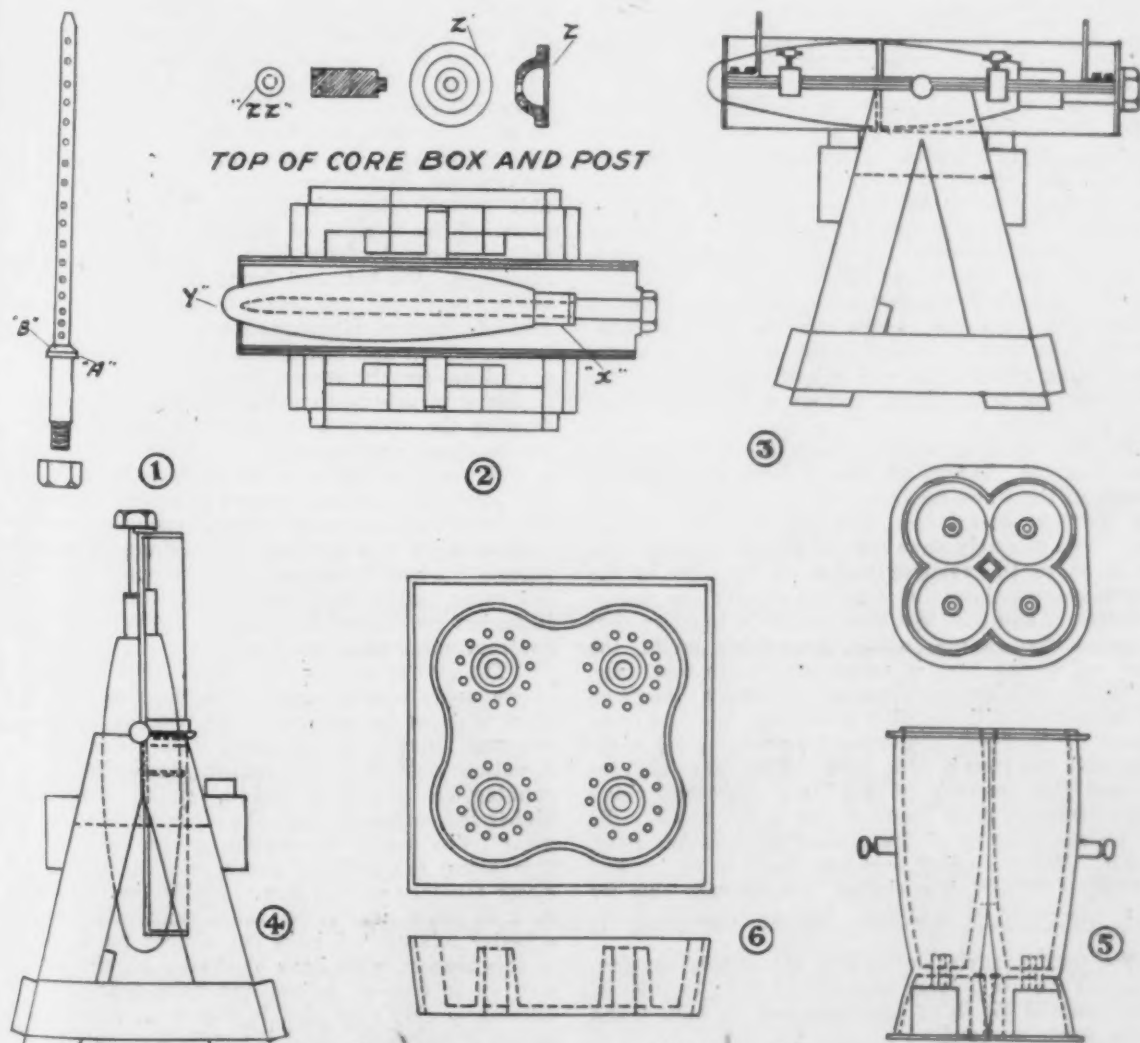
## Making Semi-Steel Projectiles

Method of Molding, Including Core Making, and of Machining as Practiced by the American Radiator Co. at Buffalo

THE method of molding, including core work, and also of machining semi-steel projectiles, was discussed in some detail at a meeting of the war resources committee of the War Industries Board of region No. 5, held at the Chamber of Commerce Building, Pittsburgh, Sept. 11. It will be recalled that the Ordnance Department program now calls for a tremendous output of the cast shells. A number of foundries have been engaged in the experimental work preliminary to establishing approved practices and contracts are now to be let generally to gray iron and malleable foundries within such restriction as to dis-

tricts as the fuel and transportation conditions of the zone impose. One of the companies which have been casting the semi-steel shells is the American Radiator Co., and incidentally this company was able to obtain knowledge at first hand of the best procedure from similar work which its French and Italian plants have been turning out. Representatives of the company attended the Pittsburgh meeting, which was a gathering of foundry interests likely to be mobilized for the work, and told how they had met the American requirements.

A committee of five men, representing machine shops and foundries of the district, was appointed as



Figs. 1, 2, 3 and 4 Cover the Making of the Sand Core for Molding the Shell. Fig. 5 shows the flask for holding four shell molds and Fig. 6 the pouring basin for the four shell mold

follows: George L. Brown, Marshall Foundry Co., Pittsburgh, chairman; William C. Rice, Pittsburgh Iron & Steel Foundries Co., Midland, Pa.; Charles J. Mesta, Mesta Machine Co., Pittsburgh; W. H. Hamilton, Rosedale Foundry & Machine Co., Pittsburgh; J. A. Katzenmeyer, Standard Engineering Co., Ellwood City.

Robert Garland, chairman of the war resources committee of region No. 5, presided. By way of introduction Lieut. C. A. Carpenter, production division, Pittsburgh ordnance district, said it would be desirable for the smaller shops to select the fixture work and to separate the foundry end and the machine shop end. It would then be possible for one shop to cast shells, another shop to cast the necessary fixtures, a third shop to machine the shell, and possibly a fourth shop to handle the machining of the fixtures. Dr. George W. Sargent, chairman metallurgical board, Ordnance Department, Washington, and Capt. H. W. Huxley, engineering division, Ordnance Department, Washington, discussed the design and specifications of the shells.

The first American Radiator Co. speaker was F. E. Hall, metallurgist and chemist. The main points he made were: For shell work "the semi-steel needs to be very fluid—smoking hot—and must not be in the least dull, because it must liberate its gases, and on account of the lower carbon it has a greater tendency to become sluggish. It must be handled rapidly and

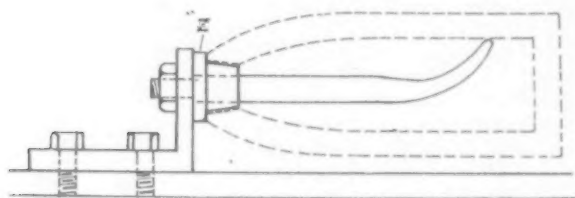


Fig. 7—How the American Radiator Co. Locates Turning Center of Casting

must have a very high initial temperature. In order to get this it is necessary to handle the cupola more carefully. A little higher percentage of coke must be run, and the details of the cupola practice must be followed very closely. We have not found it necessary to change our cupola design in any way, for the reason that we require hot metal anyway in our regular work. We use the low tuyere type of cupola. We run into a large mixing ladle from the cupola, the stream running continuously from the cupola into the mixing ladle, and then the iron is taken to the molds in a crane ladle holding about a ton and a half; and we find the iron holds its temperature better in handling these large quantities.

"In charging the cupola it is of the utmost importance that the charges be placed level and uniform throughout the whole heat; we charge the steel directly upon the coke and follow with pig iron and re-melt scrap. You probably have seen in various journals discussion as to the relative merits of the size of the charges, some maintaining that the smaller the charge the hotter it will be. We have found in practice that the larger the charge, within reasonable limits, the hotter will be the iron, in proportion to the coke used. But in this case we have run our charges as small as was consistent with keeping a definite layer of coke between the charges, because we believe the steel mixes better with the iron in that case. When large charges are used the quantity of steel and pig iron being greater, there is more tendency for it not to mix. So that we are running at the present time rather small charges. We are using a cupola lined to 66 in. and are using a 2000-lb. iron charge, and through July we ran a coke ratio of 1 to 6.4. But we must keep the iron hot.

"We find it advisable to flux the cupola continuously, and we use a large quantity of flux; to 2000 lb. of iron we add 250 lb. of limestone, and we have found this to work out well.

"Now, in regard to the composition of the metal. Those of you who have access to the publications of the American Foundrymen's Association will recall an article written by a Frenchman—E. Ronceray—in this

last year's Proceedings, on semi-steel shells. This article approximates closely what we have found since we have been making experiments in this country. (Reference made is to publication of *Transactions of American Foundrymen's Association*, Vol. XXVI., page number 122.) The object of using steel is to reduce the total carbon. Ordinary cast iron will stand an impact test of 13 or 14 in. under United States test. The specifications require 18 in., and ordinary cast iron will not stand it. The total carbon must be reduced. We would like to run the carbon down to 3 per cent, which would enable us to use a little higher silicon; but with our iron in the Buffalo district we have not been able to get much below 3.20 total carbon. When our carbons increase abnormally, we add more steel, and this has a tendency to render the iron more sluggish, and there is a limit to the amount of steel you can use. We have found that 25 to 30 per cent works out well, and with this percentage we get a total carbon of approximately 3.20 to 3.30, and with this we run the silicon from 1.10 to 1.20. Our aim is to maintain the total of the silicon and total carbon at or slightly below 4.40. That is an important point, because if the total carbon increases, the silicon must be reduced, or your iron will weaken. On the other hand, if the total carbon decreases your silicon must be increased or your iron will become too hard, and will chill."

In regard to the sulphur, he agreed that it should not exceed 0.12 per cent, although so far as the strength of the iron is concerned, an excess above this would not hurt it. "But the tendency of high sulphur iron is," he continued, "to cause blow holes. As to phosphorus, we are just now in the midst of experiments to determine how high we can run it and still pass the impact test. On Monday last we ran a heat which came out 0.22 approximately, and the impact test on this showed 24 in. That was the limit of our machine, and the bar did not break at that point. So it looks from that as if we may be able to use a phosphorus of between 0.30 and 0.40, which, I think, our Buffalo irons will maintain, with 25 per cent steel and possibly 35 per cent re-melt. Manganese, we like to carry between 0.75 and 0.85 and control by the use of ferromanganese. Our French people state that it is preferable to use spiegel rather than ferromanganese, because of the liability of the latter's not mixing properly on account of the high percentage of manganese contained. We have not found this trouble, but we do use a low percentage ferrosilicon—about 10 to 12 per cent—to control silicon content. We find a greater loss in silicon and manganese in this material than in gray iron, for the reason that the steel has a greater tendency to oxidize than pig iron has, and in this oxidation the silicon is carried out, and also the manganese, to a greater extent.

"We take our drillings for analysis from the impact test bars. We run our mixture as carefully as possible, and we attempt to have it without variation throughout, and we analyze a mixture of drillings from different parts of the heat to represent the entire plant, except in a few cases, at the start, we did take samples from each ladle, but we did not find enough variation to warrant our continuing that practice.

"The Italian and French plants used Bessemer pig, so we used Bessemer pig. But the Government tells us it will not be possible to get that material, so we are now using ordinary gray iron. The French instructions specify a high carbon steel—that is, a steel running 0.50 or over in carbon, for the reason that the higher the carbon in steel, the lower will be its melting point. The use of the higher carbon steel will therefore bring the melting points of the steel and iron closer together and so it will enable the two metals to melt at more nearly the same temperature and give a better mixture. I have not noticed much difference in this respect. We have used steel all the way from 0.10 up to 0.60 in carbon and have found very little difference. My own idea is that steel absorbs carbon before it will melt. And it simply has more to absorb if you use the low carbon steel. However, we have found the steel from shells—the scrap from steel shells

\*Steel, iron, remelt (risers and returns of imperfect shells) and alloys.

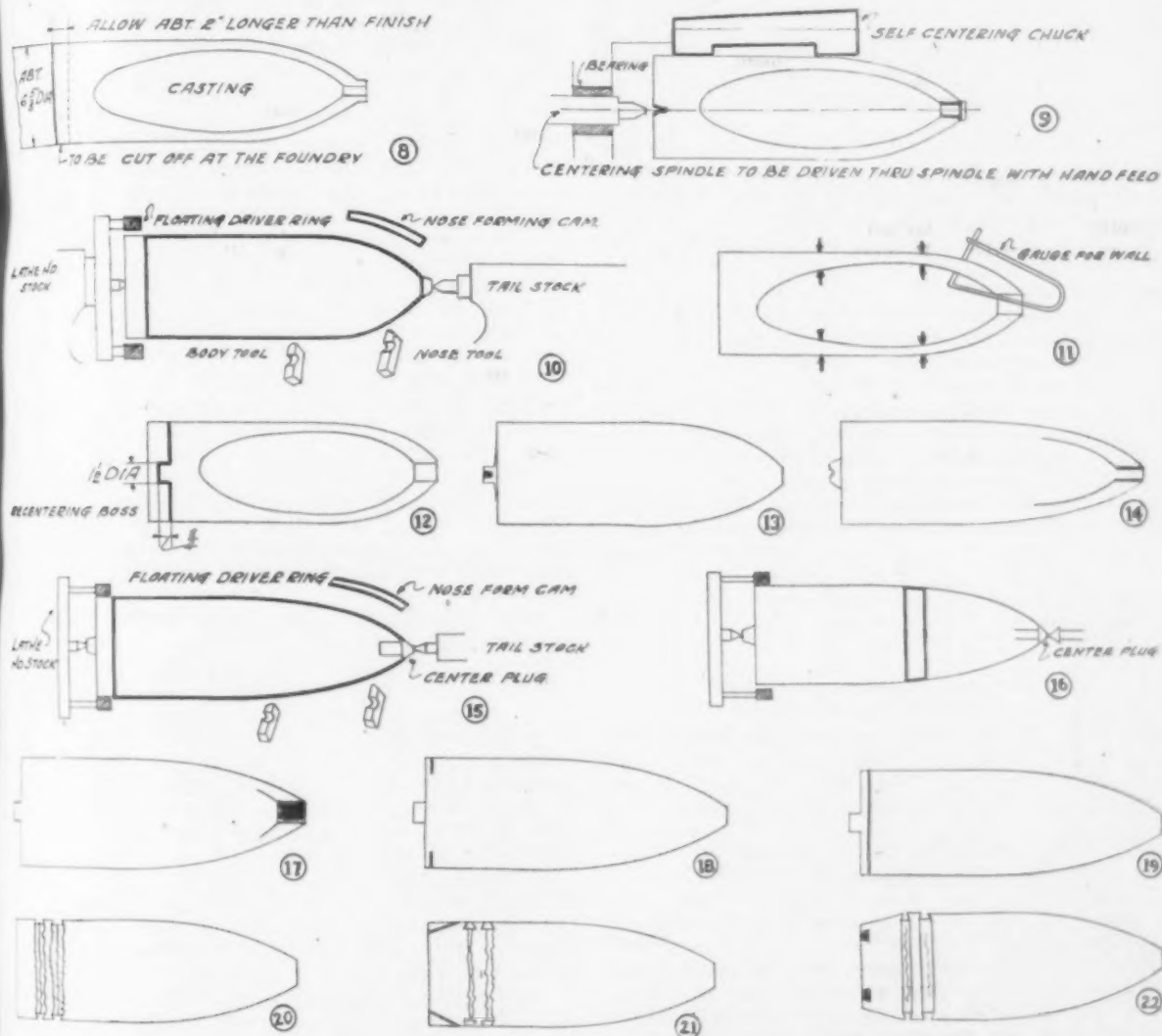
butts and ends, make a very fine material. But there again the Government is going to cut us off from this material.

"We do not like to have the pieces too heavy, because they will not melt, and we get them in the drop after the melt. We like a piece just such as would come from the end of a steel shell of a size perhaps 10 to 20 lb., though of course you can use larger than that. A rail end 2 ft. long would not be excessive in weight, but the scrap should not be too thin.

"The first iron of the cupola is not suitable. We find this is usually weak, and falls below the tensile strength and sometimes will not stand the impact test. So that we 'pig' a ton or two of the first iron out of the cupola and then drain the ladle, and after that

as indicated by B merely shows the lowest point at which the iron or semi-steel comes in contact with core. At the extreme end the iron shank is threaded, and nut is used for the holding of arbor in proper position while in core box, and same nut later used for the drawing of core in correct position in flask.

The pipe part of arbor as shown has a number of drilled holes (about  $\frac{1}{4}$  in. in size) for letting off the core gas at the time of pouring the shell. For the successful venting of the core the pipe part of arbor is wrapped with scrap burlap. The holes do not become packed with sand, allowing the gas free travel to interior of arbor and out through bottom of flask—all molds being poured with butt end of shell up. The cost of the burlap, and the time of wrapping same on



Figs. 8 to 22, Inclusive, Cover Steps in Machining the Semi-Steel Shell

the iron is stronger. That is where we get some of the re-melt."

The second American Radiator Co. speaker was Samuel Moore, manager of the Buffalo plant. The following notes cover in part what he said of the plant practice pertaining to the various operations as to the manufacturing of the 155 mm. shell, starting with the core room operations and following through with shell to the shipping department:

Fig. 1 is a rough sketch showing the type of arbor or core support used, consisting of a piece of standard  $\frac{1}{4}$ -in. pipe at one end rolled to about one-third of its regular diameter and opposite end threaded and screwed into a cast-iron shank, the latter being machine finished to the 1000th part of an inch as this shank must have a perfect fit with both core box and later with the cast-iron flask, as the same method of supporting arbor in core box is used in supporting arbor in flask.

At the point marked A is a shoulder which is used for the supporting or holding of the sand. The line

arbor is more than saved in cleaning operations, for with the assistance of the burlap (which becomes a powder when casting is poured) the arbor is easily drawn from shell.

After wrapping of the burlap on arbor the next operation is placing of arbor in lower half of core box as shown in Fig. 2. The nut is first run up on shank end of arbor and then upper half of core box placed on top of lower half, and the two securely held together with four screw, or cam and lever clamps, the nut then tightened by hand pressure, which is sufficient for the holding of arbor in good position at the time of the ramming of the sand, for as before stated the machining work should be very accurate, or in other words, the shank of core arbor and corresponding part of core box must be a perfect fit.

Core box is then placed in a vertical position as shown in Fig. 3. The butt end of core box is cut away, allowing an opening for the feeding of sand mixture into box. A very small amount of sand is first put in



box, allowing only about the sufficient amount for the ramming at space marked X, as the core at this point must be very hard. For this ramming process either a piece of bar iron about  $\frac{1}{2} \times \frac{1}{4}$  in. or a piece of hard wood of about the same measurements will successfully handle the operation. Sand is then fed into core box, and similarly rammed to point marked Y. The next operation is to run a vent wire at about three different places down through core parallel with arbor and down to points near nose of core, but the vent wire must not come in contact with sides or nose of box. The holes left by vent wire are filled in at end, and sand packed down with fingers and three eight-penny nails inserted as per sketch.

The loose round cover or shape as shown on sketch Z is put in place and sand rammed with small tool or fingers. The small piece of about  $\frac{3}{4}$ -in. round marked ZZ is then pressed in place for the shaping of the extreme top, and the ramming of the core is completed. Next the piece ZZ is drawn out and with same piece in hand the cover Z is lightly rapped and drawn away from box.

The core box and core is again rolled over to a horizontal position. The clamps are then removed and after rapping upper half of core box it is drawn from lower half by use of the two handles on upper half. The half of the core box and core is swung again into a vertical position and nut on end of arbor is then unscrewed about one turn.

Then gripping nut firmly in one hand the core box, including core, is moved slightly beyond a vertical position. Then the core box is lightly rapped and core will swing clear of box. With nut on end of arbor the core is carried to core carriage on rack in oven, and hung by means of nut for the baking of core.

The mixture for the making of this core comprises the following: Fire sand or any good pure silica sand, ground fire clay, No. 1 new molding sand, sawdust, molasses and water. The ratio as follows:

- 1 Box, 12 x 12 x 10-in. fire sand.
  - 1 Box, 12 x 12 x 3 $\frac{1}{2}$ -in. ground fire clay.
  - 1 Box, 12 x 12 x 3-in. No. 1 molding sand.
  - 1 Box, 12 x 12 x 1 $\frac{1}{2}$ -in. saw dust.
- To the above should be added 1 pt. of molasses and 2 qt. of water.

The ovens have a temperature of about 425 deg and for the best baking of the 155 mm. core "we have found that 3 hr. is required, and at the end of this period core truck is drawn from oven, and when cores are about cold they are taken from truck and dipped in a wash consisting of a good grade of mineral blacking—plumbago and clay wash. Before this compound has thoroughly dried about 4 in. of the butt end of core is again dipped. Core is then again placed in oven at same temperature, and baked for another hour." A girl should turn out 70 to 90 good cores per day and a man 80 to 120.

As to the subject of molding, the experiments were first carried on using a flask with but one shell in a mold, and with successful results—but with the foundry mostly equipped with jolt machines, over-head cranes and underground sand conveyors, and in fact equipped for heavier work, it was decided to use a single flask, but with proper design and large enough for the molding of four shells in one mold.

The design is similar to Fig. 5, following more or less the four-leaf clover, with a hollow perforated column cast in the center of flask for the venting of the mold. The flask is placed on a jarring machine—four patterns with shanks same size as arbor. Shanks of cores are placed in flask and nuts of same size as used on core arbors used to hold patterns tightly in flask. Sand is then fed into the flask and mold jarred, and then with vent wires about  $\frac{1}{4}$  in. in size a number of holes in mold are made parallel with sides of pattern so as to in every way assist the venting. The nuts on shanks of patterns are then removed and patterns drawn from mold. An overhead crane then takes mold from machine to floor. Plumbago is then sprayed on mold and where possible to reach is also rubbed on by hand so as to assist in every way in the peeling of the sand from mold and reduce the cleaning cost.

Cores are then placed in mold by hand, and nut

put on arbor so as to hold core securely in correct position during the pouring of the metal.

The system of gating and pouring the mold is simple and inexpensive. With this gate and vent stack it is not necessary to bake the mold of this size shell—but some difficulty was experienced in casting the 3.3-in. shell with a total molding and machining loss less than 25 per cent.

"We therefore established as our practice a pouring box and strainer gate as per Fig. 6, and have not found any difficulty in the casting of any of the shells of 4.7 in. in size and larger, in molds of green sand and same pouring box used with 3.3-in. baked sand mold."

The pouring box includes a strainer gate for the feeding of clean iron only to the casting and a vent stack allowing the gas to freely leave the mold. This arrangement consists of but a slab of baked core sand with about eight  $\frac{1}{4}$ -in. holes properly located so as to allow the semi-steel to feed into mold without dropping against either the side of core or side of mold, only striking the mold at point near nose of shell.

The gas while pouring goes to top of flask and out of vent stack. Between the outer cast-iron sides of box and dry sand strainer gate is rammed about  $1\frac{1}{2}$  in. of molding sand. The runner head is set on top of the four-mold flask, and held down with two clamps and clay or sand placed around joint to protect against run-outs while pouring.

As soon as core has stopped venting after the pouring, the nut should be removed from arbor—and then shell allowed to remain in flask for cooling not less than 4 hr. before shaking out.

The riser on a shell is equal to at least the diameter. In other words, a 6-in. or 155-mm. shell, which is in the rough about  $6\frac{1}{2}$  in., should have a riser  $6\frac{1}{2}$  in. high. The 6-in. shell with riser weighs 150 to 153 lb. With riser cut off, 105 lb., and finished around 84 lb.

Six men should make per day in the foundry with machines, cranes, etc., 75 flasks or 300 shells, or 50 shells per man, or in single flasks (or one shell in a flask) and with hand ramming, from 50 to 60 molds with two men.

For cleaning the practice is to blacken the mold properly with plumbago and to clean the exterior by hand, using old pieces of emery stones.

For the cleaning inside, the shell is lifted by air hoist attached to a contracting clamp with nose of shell down. Directly under the shell a piece of an old  $\frac{3}{4}$ -in. wire or steel cable with strands more or less parted is fastened at one end to a flanged pulley which is protected from the dirt from the inside of casting. This pulley is driven at about 1200 r.p.m. after the shell has been lowered over end of cable—and by the speeding of cable and lowering and raising of the shell, in about 5 min. the interior of shell is very clean. Shell is then taken to a circular cutting-off saw, and including the handling time, the 6-in. end is cut off in  $4\frac{1}{2}$  min. and the nose end in 2 min.

"We have an order at the Bond plant for 2000 of the 6-in. shells per day, and it is our hope that we may soon be in a position where we can ask the Government for an order increasing the amount to 5000 or 6000 per day.

"Two of our machinists report to work at 12 o'clock noon, and remain until the test bars of the day's heat have been machined. At 7:30 a. m. the following morning these bars are in the hands of the chemical laboratory and by 8:30 to 9 a. m. the results of the previous day's work are available before castings have even been cleaned or analysis figured for the day's heat. Should the heat fail to pass the tests the company has not spent the cost of cleaning."

An 8-in. shell will weigh 320 lb. before riser is cut off. A flask for the molding of four 6-in. shells in one operation will weigh about 800 lb., and for the molding of this flask two good job molders will make one per day. Of the single flask three good molders should make about three flasks per day, each weighing about 180 to 200 lb. A cupola lined about 74 in. to 78 in. will have a capacity of about 15 tons of semi-steel per hour, and therefore, when figuring on a shell contract one should not necessarily figure in round numbers such as 1000 or 2000 shells per day, but should consider



cupola capacity. In other words a 76-in. cupola at 15 tons per hour and operating for 7 hr. would total 105 tons per day, and with gross weight of a 6-in. shell 155 lb., the contract should be for not over 1350 per day. A cupola lined to 60 in. would give on a 7-hr. continuous operation about 900 shells per day.

A floor space 50 x 100 ft. with flasks containing four shells will handle 400 to 500 shells.

In the machining of the shells the operations are as follows: The butt end and nose having been cut off, the first operation is the finding of the center on butt end, and the simple device shown in Fig. 7 will quickly and accurately give the center. Into the angle plate is screwed a fixed hook, which, when the nose of shell is placed against the bushing Z will come in contact with inside surface of shell, as shown by dotted line. A surface gage is used for scratching a parallel line on end of shell, and after shell has been turned at 90 deg. four different times, and gage used each time, we easily find the center of casting with relation to the core. This center is then punched and drilled.

The next operation is to clamp the shell in a drill press and with the use of a combination reaming, tapping and facing tool, complete the nose. A nose piece for a center is then screwed in.

Casting is then placed in lathe and clamped near nose of shell. With a double tool post a roughing and finishing cut of the straight side of the shell is taken. Groove for band is cut and knurled and butt end of shell cut off for maximum length. Shell is then reversed and double tools finish the profiling of shell.

The shell is now ready for Government inspection, and after having been properly gaged and weighed a nose piece is inserted in nose of shell and pressure of 110-lb. air placed in shell and a soap-suds test here given.

The shell is then given a hydraulic test of 3200 lb. per sq. in., and while on test shell must not expand over 1/1000th per in. in diameter, or in other words, a 6-in. shell must not expand over 0.006 in., and after pressure is released must return to its original size. From this operation shell is taken to the press and copper ring pressed on. Then at a lathe the finishing of band and the cutting off to proper length are the operations. Time required to handle and press on band should not require over 2 min. and total shell machining operations from 1 hr. to 1 hr. 5 min.

E. C. Bachelar, Motch & Merryweather Machinery Co., also addressed the meeting, presenting the sketches here reproduced as Figs. 8 to 22, inclusive, and giving the following explanation: Based on an output of 250 155-mm. shells in a 20-hr. day, the actual machine time, with an allowance for inspection, was 66 min. "We estimate that in machining you should figure on at least 1 hr. 15 min. to 1 hr. 30 min. The total cost of equipment, including suitable tool-room equipment, is \$60,000. That equipment would consist of 22 machines for machining shells and 10 machines for the tool room. Many of you, however, have tool-room equipment.

"The floor space for the shell operations would be 1500 sq. ft. The floor space for the tool room would be 500 sq. ft., making a total of 2000 sq. ft.

"In laying out the shell operations, based on 250 shells in 20 hr., on some operations one machine is required, and this machine would not be busy all the time; so that in making up additional units—that is, by increasing this, say, 500 to 1000 per day—the initial cost would be decreased."

Flying the flag of the United States Railroad Administration and carrying the equivalent of 150 carloads of freight, the first fleet of the Government's Mississippi-Warrior Waterways project is now en route from St. Louis to New Orleans. River transportation was inaugurated last week with impressive ceremonies. The fleet was comprised of the towboat Kokomis with a tow of three barges. Five steel towboats and 29 barges have been assembled and regular Saturday sailings between St. Louis and the Gulf will be maintained hereafter.

## New Construction for the Army

WASHINGTON, Oct. 8.—The Construction Division of the Army has been authorized to proceed with more than \$3,500,000 worth of important buildings. These include the following:

Phosphorus plant near Fairmont, W. Va., to cost \$500,000. The contract has been let to the American Phosphorus Co.

Tetryl plant at Senter, Mich., to cost \$250,000. This includes the cost of the construction of the necessary buildings and equipment, included in which will be the boiler and power houses, facilities, packing houses, magazines and tramways.

Buildings for a proving ground at Elizabethport, N. J., estimated cost, \$110,000.

Additions to the Rock Island, Ill., arsenal which consist of the addition of three stories to the warehouse and the construction of an addition to the artillery vehicle plant. The facilities for fire protection will be increased by the installation of turbine pumps and an extensive system of water mains and hydrants. A large garage for motor trucks will also be erected. The estimated cost is \$833,500.

Shops, warehouses, barracks and office building for the utilities detachment at Camp Upton, N. Y. There will be five barracks for enlisted men and one for officers. The estimated cost is \$128,650.

Additions and extensions to the Frankford, Pa., arsenal to cost \$1,000,000. The work consists of the extension of the loading room, annealing rooms, action press shop, barrack buildings, additional storehouses, stable, carpenter shop, a forging plant with equipment, a sea-wall along Frankford Creek and other work to facilitate the production program at this point.

Additions and improvements to existing buildings at the base hospital located at Camp Stuart, Va., will be provided at an estimated cost of \$448,200. The new buildings will consist of additional officers' quarters, laboratories, storehouses, and alterations to the administration building, receiving ward, nurses' infirmary and nurses' quarters.

The Department of Labor has awarded a contract for the construction of 14 apartment buildings and two garages at Washington, to the Fred F. French Co., 299 Madison Avenue, New York. This contract is let on fixed fee basis. A similar contract for 76 houses, utilities and town planning at New Brunswick, N. J., has been awarded to John Lowrey, Jr., 8 West 40th St., New York, and one for 149 houses and utilities accommodating 191 families at Waterbury, Conn., has been awarded to The Tracy Bros. Co., Waterbury, Conn.

## Steel Shortage Shuts Down Plant

The big forge shop of the Liberty Ordnance Co., Bridgeport, Conn., operated by the American Can Co. on shell contracts has been closed down for an indefinite period due to the emergency demand for steel rails for the army in France. It is reported that other shell forging plants will also be affected but that the yards of the shops machining the shells are piled high with reserve stocks and that the output of finished shells will not be affected. Arrangements are being made to take care of the workers in the forge shops so that they will lose no wages through being out of work and that they will be returned to the plant when production is resumed.

Fifty representatives of the Semet-Solvay Co., Syracuse, N. Y., from all sections of the country were present at the annual fall meeting, Oct. 1 and 2, at the home offices. The first sessions were held at Solvay and were interspersed with informal talks. Warren Blauvelt, associated with the United States Fuel Administration, gave an interesting address. A dinner was given in the ballroom of the Onondaga Hotel on Wednesday evening, Oct. 2, closing the meeting, and at which Robert S. Wolf of the Emergency Fleet Corporation gave an address on "The Work of Humanizing Industry."

## FUTURE OF ELECTRIC STEEL\*

### Developments in Certain Advantages of the Process—Conservation of Alloying Elements

BY DR. JOHN A. MATHEWS

In judging the future of any process we must be guided more or less by its past. The electric furnace in steel manufacture has not a very long history; in fact, as a practical invention it may be considered as running concurrently with this century, while as a commercial factor in the production of steel it can scarcely be considered more than 10 years old, and its period of greatest progress has been since the beginning of the European war. We are in our thirteenth year of the manufacture of electric steel, which is a very long time so far as this branch of the industry is concerned.

Some time before we actually entered the war I said that not only in automobiles and airplanes but in many other ways, electric steel would give a good account of itself for military and naval purposes. I can now say that it has done so. From following the development of electric steel and the important part it has played in vital construction, I think there is no question but that it has more than made good. It might, in fact, be called "super-steel." Its merits have called for some revision of our ideas as to what may be done with various alloy steels. It has had the indirect effect of stimulating better production on the part of open-hearth and Bessemer steel makers, and thus it may be considered as a beneficial acquisition to the entire steel industry.

#### Metallurgical Skill Necessary

When Sir William Siemens stated over 40 years ago that the function of electric melting is "to effect such reactions and decompositions as require for their accomplishment an intense degree of heat coupled with freedom from such disturbing influences as are inseparable from a furnace worked by the combustion of carbonaceous materials," he only stated a part of the conditions essential to the production of the highest grade quality. As in the conduct of the war, so with electric steel—it is man power that counts; but with electric steel this power is qualitatively considered and not quantitatively. The electric furnace requires for successful operation less labor per ton than is necessary for crucible steel, but it calls for a higher grade of metallurgical skill in order to produce the best results. The furnace itself and the conditions of electric melting are not enough in themselves, but must be supplemented by skilled handling. Such skilled men are only developed by experience and training and are not too plentiful at the present time.

It seems from the authorities who have testified on this subject that the relative merits of the electric process as compared with other processes have been fully established and are generally admitted. A process, then, which is giving such an excellent product will doubtless grow and thrive after the war as it has done during the war. Whether there will be a temporary recession of the growth of this branch of the industry, and whether or not there may be too many or too few furnaces in the country at the time the war stops, it is not possible to say, but when we consider the advantages of the process coupled with the actual results obtained in its relatively short history, we cannot doubt that it will have an established place in the industry.

#### Some Advantages of the Process

Let me recall briefly some of its advantages. Easily oxidizing metals, like vanadium, chromium and manganese, are readily handled in the electric furnace, and hence less of them need be had to give a final minimum content in the steel. There will be less of the oxides of these metals produced in the steel and to be removed from the steel. Sulphur and phosphorus can be readily eliminated, and it is obvious that if they are

essentially absent they cannot segregate. We all know the difficulties that makers of open-hearth steel are having in maintaining low sulphur in steel due to the character of the metallurgical coke and to the gradual failure of natural gas as a fuel in many of the larger steel producing districts. In fact, for several years now there have been general increases asked for, and for the most part granted, in the standard specifications so far as sulphur and phosphorus are concerned. However, if sulphur and phosphorus can be readily controlled and reduced to negligible quantities it is obvious that cropping may be reduced and the yield of sound steel increased.

With the electric furnace, alloy steels are made in the furnace itself rather than in the ladle, and in this way there is better opportunity for increasing the solution, diffusion and homogeneity in the product. All of these things make for high quality, and quality is the first consideration. In addition to this, the electric furnace performs an economic function because of its adaptability for handling and recovering alloy values contained in scrap. This is of especial importance during the war, when alloys of all kinds must be conserved, and this is especially true with regard to chromium, manganese and vanadium. The alloy content of these elements in scrap used in the open-hearth steel is only recovered to a very small extent, and not only is the alloy value lost but the oxides formed are frequently a source of trouble in the final product.

#### Future Full of Promise

We therefore consider the field for electric steel in the future a very promising one. When its merits are fully recognized, new uses for it will be found and the difference in price between electric steel and open-hearth steel will not be considered of such serious moment. If designing engineers have full and complete confidence in the steel they are using they can design accordingly so as to use more highly stressed parts and lighter construction, with attending advantages. This feature would be of special interest in the construction of airplane engines.

#### Increased Production at Essington Plant

A production record of 105,000 lb. of steel forgings in one day was recently made by the crew of 12 men operating the 1000-ton hydraulic press in the forge shop at the Essington plant of the Westinghouse Electric & Mfg. Co., South Philadelphia. The output of the press consists of steel forgings for turbine and reduction gear axles and propeller and tail shafting. The record referred to marks the climax of a week of intensive production which increased each day from 83,000 lb. on Monday to the record figure on Friday. The average daily output of the foundry is approximately 300,000 lb. of gray iron castings. The plant has been completed in less than a year and will not operate at its full capacity for some time. When capacity operation is attained, it is expected that the complete equipment of steam turbines, reduction gears, condensers, pumps and other auxiliary machinery required by a single vessel will be turned out each day.

Female labor has been employed in the condenser department for over two months and has recently been introduced into the sheet metal working department for the production of steel boxes and lockers and a portion of the blading section of the turbine department.

M. A. Hanna & Co., Cleveland, have issued a revised supplement to their ore booklet giving a table for figuring premiums and penalties based on general prices of Lake Superior iron ores for the season of 1918, on and after Oct. 1, in accordance with the revision of base prices recently made by the Government, advancing prices 25c. per ton.

The New Jersey Zinc Co., 55 Wall Street, New York, has issued a new set of booklets which it calls its handy reference library of zinc products. The books are entitled, "Pigments," "Metals," "Rolled Zinc" and "Zinc Dust" and will be sent to firms interested in zinc.

\*From an address read at the thirty-fourth general meeting of the American Electrochemical Society, Atlantic City, Oct. 1, 1918. The author is president Halcob Steel Co., Syracuse, N. Y.

# Steel Retrenchment at Home and Abroad

Interallied Agreements Bringing Important Results—Chairman Baruch Fears Railroads Will Be Short—Praises Director McAdoo

WASHINGTON, Oct. 8.—Steel retrenchment is being co-ordinated on both shores of the Atlantic now, thanks to the newest developments of the interallied pooling agreements which are being perfected. Chairman Baruch of the War Industries Board gave the first hint of the perfection of this long process in a conference last week when he told of the progress that had been made to check up on all questions of consumption and production to get the greatest possible results from all the varied resources of the United States as well as of the Allied Governments in Europe. The new program provides for the closest kind of inter-workings of our varied industrial schedules, and approximates the unity of our military command in the control it gives to the representatives of the various nations over all items of raw material and manufactured products, including food, fuel, shipping and even questions of finance. The real machinery is to be in the hands of the Inter-Allied Munitions Council in Paris, which held its first session last week, and our own interests there will be in the hands of Edwin R. Stettinius and Leland Summers, representing the War Department and the War Industries Board.

Approaches to this radical pooling of our supplies and demands—which is what it practically amounts to—have been made from time to time in interallied pools on less important commodities, such as tin, tungsten and aluminum. Through the War Industries Board there has been practically a similar control over steel, and through the Food Administration an apportionment of food resources. Now it will cover all items.

The new concentration of control is to be particularly invoked in cases where two or more governments are interested in supplies which must be transported overseas to supplement deficiencies in home production, or where several sources of supplies should be agreed upon, together with the allotment and method of their distribution or utilization; or where there might without agreement be competition between governments in securing supplies or a wasteful duplication of productive effort.

"We are accomplishing a great deal by our new program of greater interallied control," declared Chairman Baruch in telling of the measures which were necessary to meet the continually increasing demands for steel from General Pershing.

"That demand is now so great that we are forced to make even greater retrenchments at home than we had hoped. Thanks to the care with which these questions are now being checked up in Europe, we hope to be able to meet the problem. There has been a marked progress in this revision of figures on the other side.

"But the retrenchment in the use of iron and steel over here has not gone far enough yet to meet General Pershing's needs. You see the continually moving front of our army, over territory torn from the Germans, brings with it new problems of transportation which must be met. Our engineers and road builders are laying rails under fire to keep the transportation up to the front of the army. This requires vast quantities of rails, to say nothing of locomotives and cars. The Germans leave nothing of that kind behind them. It must come from over here.

"Pershing First," Said Director McAdoo

"Just now we are compelled to take it from the allotments which we had made to the United States Railroad Administration. I must say that Director General McAdoo has shown a fine spirit in dealing with this question. When we put it up to him, he said without hesitation: 'Pershing First.'

"He told us that he would leave it all to our judgment to decide what should go overseas, and that there would be no complaint from the railroad administration over any quantity of their allotment that might be sent to General Pershing's forces.

"But as a result of this I fear that we are going to have railroad difficulties this winter. Only by superhuman effort will the railroad administration be able to give anything like real service, for we are cutting them to the bone on the things which they had asked, and they are going to be short of cars and locomotives. I will say this for the Railroad Administration, however: They are getting far more out of what they have than ever before was gotten out of the railroads. They are working under handicaps of which the public has no knowledge."

## Distribution of Tin

Chairman Baruch also announced that under the recent decision of the War Industries Board to take over the control of the domestic pig tin situation by the formation of an interallied pool to govern imports and a license system to cover its use in this country, the United States Steel Products Co. would alone be granted import licenses. This company, he announced, would act under Government direction and in the interests of all consumers. All users and dealers in pig tin will be licensed and will secure their future requirements of pig tin from the United States Steel Products Co., which will make its distribution directly under the control and the supervision of the War Industries Board.

The Inter-Allied Tin Executive who will carry out the terms and the agreements of the Inter-Allied Pig Tin Pool which was recently created in London will control the buying price in each producing market. The War Industries Board will control the prices and terms under which the pig tin is to be sold to the domestic users and consumers. Under the terms of the London agreement, the pooling executives will not make the actual purchases. Those will be made by the purchasing corporations of each country. The Pool Executive will merely fix the prices and allocate the purchasing territory.

Preliminary to the issuance of licenses to American users and dealers, an inventory of stocks on hand and contracts unfilled by the more than 2000 individuals and plants affected is being made by the Tin Section of the War Industries Board. If necessary, announced Chairman Baruch, there will be a redistribution of stocks on hand to equalize them according to essential uses. The new arrangement will in no way loosen the stringent regulations which now govern the consumption of tin and tin plates.

Preliminary work has been started on the proposed new plant of the Pacific Coast Steel Co. at Willbridge, Ore. The first unit will comprise two open-hearth furnaces, rolling mill and blooming mill. It is planned to ultimately install eight furnaces. The company plans to start production about March 1, and will turn out flat steel of all sorts, such as bars, angle steel, channel, etc.

The Brier Hill Steel Co. has installed a battery of seven 700-hp. Stirling boilers at its Youngstown, Ohio, plant, which will be fired by gas generated at the blast furnaces, additional power being needed with the new units added within the past few months and others to be put in commission soon.



# The Development of Stellite

Melting Problems Solved by Snyder Electric Furnaces  
Which Displaced Gas-Fired Crucibles—Three Furnaces  
Have Capacity of Over Four Tons in Eleven Hours

BY ELWOOD HAYNES\*

**W**HEN the gasoline automobile passed the experimental stage and became an economic necessity, the demand for cars compelled the automobile manufacturers to seek new means to increase production. The necessary tools, in sufficient quantity, could not readily be obtained,



Battery of Gas-Fired Crucible Furnaces which were Used in the Manufacture of Stellite but were Displaced by Electric Furnaces

so that the problem resolved itself into that of getting the highest possible production from the equipment. Many new alloys and special tool materials were tried, with varying degrees of success. New ways of machining were tried, new machine tool operations replaced the old, new machine parts were designed, but still the production lagged too far behind the needed output.

As one result, this led to laboratory experiments for the purpose of finding a better material for tool use—a material that would enable the machine operator to do more work in less time. It was known that certain of the semi-rare metals could be made into cutting tools, but the right combination of hardness and strength had never been obtained. With this as a foundation for the experiments, the laboratory work was begun with the definite object of utilizing these semi-rare metals and obtaining the proper cutting-tool qualities by adding a third element. Working out this idea required a great deal of patient labor, but after much time had been spent in the solution of

the different problems that were constantly arising, the correct combination of metals was finally found that gave the desired results. These latter experiments still further developed resulted in the first production of stellite.

The name "stellite" is derived from the Latin word *stella*, a star, because when the alloy is polished it takes a beautiful silvery color and luster. The first experiments in the development of stellite were made for the purpose of combining metals to make an alloy that would be sufficiently hard and that would have the strength to stand up under heavy cuts. Although, at first, there was some difficulty in obtaining the strength and getting a hard cutting edge, these experiments showed that chromium, cobalt and tungsten of which stellite is made could be alloyed in such a way as to give the desired results. In 1912 these experiments culminated in the perfected laboratory production of stellite.

Stellite is an alloy of these semi-rare metals, but contains no iron and therefore cannot properly be termed steel. The binary alloy, consisting essentially of cobalt and chromium, can be forged with difficulty at a bright red heat, but when it becomes cool its hardness remains as great as before the first heating. Stellite does not get harder as it gets hotter, but it gets tougher and holds the cutting edge longer. Cobalt is not affected by heat up to about 1900 deg. Fahr., and the tungsten and chromium are not affected by any heat up to 2600 or 2800 deg. Fahr. It is clear, therefore, that the cobalt becomes tougher up to the degree of softening, but at the same time the other two metals are not changed. This makes a closer and tougher bond, allays all chance of crumbling and makes the tool last longer because it has the necessary strength to take off a heavy cut without breaking.

## Gas-Fired Crucible Furnaces First Used

The laboratory production gave no promise, however, of commercial production on a large scale, because of the melting conditions that were found to be essential. Because of difficulty in obtaining sufficiently high temperatures for commercial use, quantity production of the alloy was not started until 1913. In 1914, stellite was manufactured in three grades. The first grade was for turning steel up to 0.30 per cent carbon, the second was for general purposes and the third was for work on hard castings. Gas-fired crucible furnaces were first used for melting purposes. Each crucible held a 15-lb. charge and the melting required 1½ hr. The crucibles lasted only two or three heats and had to be discarded. Sixteen of these gas furnaces were installed, but the small capacity of the crucibles, the time required for melting and the high cost of crucibles made the installation far from satisfactory. A battery of these furnaces is here illustrated.

Several further experiments were made with different forms of melting furnaces. The electric

\*President Haynes Stellite Co., Kokomo, Ind.

furnace seemed to be better adapted for the purpose, so an electric resistance furnace was installed. This held an 80 or 90-lb. charge, and when in working order it required less time per heat than the gas-fired crucibles. The complicated electrical arrangements among other things made this installation as generally unsatisfactory as were the gas furnaces. Enough was learned from this first electric furnace installation, however, to show that this type of melting equipment seemed to hold the bigger possibilities for commercial development.

#### Electric Arc-Type Furnace Solved Problem

After further study of electric furnaces an arc-type furnace was installed. This was a Snyder electric furnace, built by the Industrial Electric Furnace Co., Chicago. That was a little over two years ago, and now there are three of these Snyder furnaces used in the production of stellite, so that the problem seems to be solved.

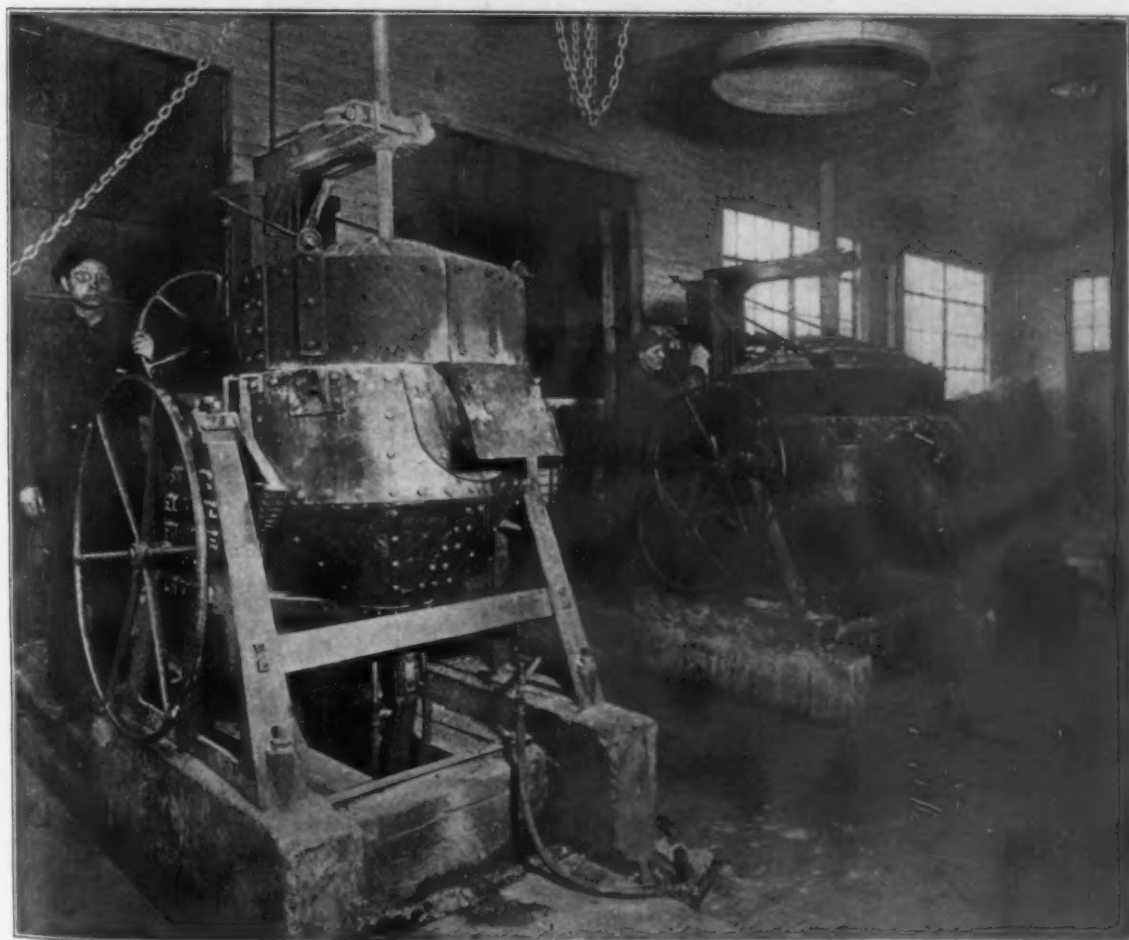
The first Snyder furnace that was installed has a capacity of 125 lb. It is connected to the regular 110-volt factory power-line of the Kokomo, Ind., central station, as no special line is necessary. This particular furnace was built for 50 kw., but was changed in the stellite plant to 100 kw. so that it is really operating on a 100 per cent overload. The present basic lining in this furnace has been in over fourteen months, over 2500 heats have been run, and the lining is still in good condition, which is a very good record for any type of furnace. One of the accompanying illustrations shows molten stellite being poured into a small ladle from this Snyder furnace. The stellite is then poured from the ladle into small molds, casting the metal either in bar form or



Pouring Molten Stellite from 125-lb. Electric Furnace into Small Ladle from which it is Poured into Small Molds to Obtain Shape Desired

in special shapes for special uses, as for milling machine cutters, chisels, knives or any other shape that may be desired.

The first Snyder electric furnace proved its worth in quick time, so that the second one was installed six months later to keep up with the increasing demand for stellite. The second furnace



Two of the Three Snyder Electric Furnaces which Produce all the Stellite Made. Both are 500-lb. Capacity and are Seen in Melting Position

is of 500-lb. capacity, 125 kw., and is connected on the same 110-volt factory power-line, and in the same way as the first. An accompanying illustration covering two furnaces, shows the second furnace in melting position, with the third in melting position in the background.

The demand for stellite continued to increase so readily and the performance of the two Snyder furnaces had been so uniformly satisfactory that the third one was installed six months after the second was started. Like the second, it is of 500-lb. capacity, 125 kw., and is electrically connected in the same way as both the others.

#### Three Furnaces Produce All Stellite Made

This battery of Snyder furnaces has a capacity of over four tons of metal per day of 11 hr., so that all stellite is now being made in this way. The cost of power, labor and lining with this equipment is less than the cost of crucibles alone, with the gas furnaces, per pound of metal melted. Power consumption averages about 1/3 kw.-hr. per pound of metal melted which makes the melting cost much lower than was expected before the installations were made. The linings are all basic

and have given exceptionally good service. Graphite electrodes are used, averaging two to three electrodes per week per furnace, on steady operation. These were found to give better results for this purpose than the usual carbon electrodes. The total cost of operation of these furnaces per pound of metal melted has been low and the repair expense has been practically negligible.

The furnaces have greatly increased the production of stellite, because bigger charges are possible and because the melting time required per heat is only about 30 min. Better metal is also possible because of the higher temperatures as certain chemical combinations are formed that cannot be obtained at the lower temperatures. This gives a better alloy—one which stands up better and lasts longer. The cost of conversion per lb. or per ton of metal is less than by any other melting method.

For these reasons the Snyder electric furnace has played an important part in the commercial development of stellite. And it is because of that commercial development that stellite is now being so widely used for such a variety of important work.

## UTILIZATION OF WASTES

### A New Steel Works Economy Department that Makes for Efficient Operating

BY FRANCIS HALL\*

It is only by actually scrutinizing, cataloging and analyzing the wastes of a big industry that any adequate idea of their variety, magnitude and value is obtainable. The average American manufacturer knows almost nothing about the subject. Perhaps not the most wasteful proportionately, but having conditions most peculiar to themselves of all industries are the steel and metal manufacturing organizations.

Some executives seem to be making a great stroke in turning every bit of iron or steel into the stock yard for prompt melting in the furnace or crucible into new ingots. Scrap undoubtedly is scarce, but so are perfectly good forgings, bar stock, tool and high-speed steel, structural pieces, shapes, angles, bolts, good materials which the hardware jobber and merchant, manufacturer and consumer is short of to-day partly because no one is taking the trouble to save them from the furnace and supply them to him, even at the present very high prices. The munition and ordnance manufacturers are producing tons of waste by-products, needed very badly by other industries, which are not being utilized for want of a proper exchange or clearing house by which producer and user of wastes may be brought together.

Very few large American industries have gone directly into saving and reclaiming the hundreds of little items that daily are lost track of through the hurry and bustle of production work. In Europe, especially on the Continent, in Germany particularly, practically nothing is wasted. Odd heaps of miscellaneous scrap and waste materials about industrial plants have become things unknown there. Their materials consequently can be made to go further than they are elsewhere. Less railroad traffic, truck service and handling are necessary; and the thousand and one other items that go to make up the keeping of big plants going at full capacity are cut to a minimum. Such an accomplishment makes for economy, cuts down living costs of a great country, and permits competition and getting the business away from other countries less efficient, at the same time without any one in that country feeling any burden.

Anticipating the need for industrial saving and utilizing of wastes, some steel plants have initiated such

a works economy. Starting in a small way a few weeks since, this department at one large steel works is picking up the small things first and gaining steadily with the co-operation of the heads of departments and the men about the plants. As most of the scrap in a works, including metal, steel, wood, fittings, burlap, wire, tools, etc., eventually gets either to the open hearth stock yards, dirt piles, dirt cars, dumps, etc., if not gathered up soon where originated, it is found best to pick it up before it gets into the chips or refuse.

In order to show some of the articles that become lost through becoming mixed with other scrap, mislaid, left over on repairs or replaced on new work, they are being collected and placed in exhibit cases throughout the works. These cases and collection boxes for small things placed nearby are painted distinctive colors. A classifying yard and office is established in the center of each plant department. It is found advisable to bring material to this yard when possible. A call or note left there or addressed to "works economy" otherwise serves to bring about the necessary action.

A rather humorous sidelight on reclamation of wastes in a big plant is the sudden and enhanced value imparted to "any old thing" which has lain around for years, when the conservation squad gathers it in. Bidders spring forth as if by magic from among various departments and want that very piece, although exactly similar pieces had for years been going their way to the scrap stock yard and furnace. Thereby, indirectly, but surely and permanently, so long as the works economy in wastes is maintained, economy is practiced.

### Information Requested by Alien Property Custodian Palmer

A. Mitchell Palmer, Alien Property Custodian, calls attention to the provision of the trading with the enemy act which requires that all money or other property held by, for or for the account of or the benefit of an enemy or ally of an enemy, shall be immediately reported to his office. This includes patents, trade marks, copyrights, prints, labels and designs. Mr. Palmer says:

Any information regarding the enemy interests in any patents, trademarks, copyrights, prints, labels, or designs, should be forwarded immediately to Francis P. Garvan, Director of the Bureau of Investigation, Alien Property Custodian's office, Washington, even if the information is only gossip or rumor. Oftentimes a clue to important enemy interests is obtained in this way. I feel sure that I can count upon your co-operation in the work of uncovering money and property of enemy character. The money thus obtained is invested in Liberty bonds, and is made to fight for our country, instead of against it.

\*In charge of utilization of wastes and scrap. Nicetown works, Midvale Steel & Ordnance Co., Philadelphia.



# Administration Plan for Reconstruction

## Senator Overman Quickly Follows Senator Weeks in Proposing Action — Republican Caucus Indorses the Former's Resolution

WASHINGTON, Oct. 8.—Senator Weeks's resolution calling for the appointment of a Joint Congressional Committee on Reconstruction has hurried the Administration to the consideration of this important problem. No explanation has been given, however, for the serious delay in this program.

Senator Overman, of North Carolina, chairman of the Judiciary Committee and father of the sweeping bill which put all Government departments into the President's hands, has introduced a resolution authorizing the President to appoint a Federal Commission on Reconstruction. This may be looked upon as the Administration's solution of the problem, although Senator Overman declares it was not prepared at the White House. There are to be five commissioners, at \$10,000 a year, appointed by the President, with not more than three members from the same political party.

The bill was referred to the Judiciary Committee. It is of such importance as indicating the program of the Administration concerning reconstruction that it is worth printing in full. The text follows:

### The Overman Bill

Be it enacted, etc., That a commission is hereby created and established, to be known as the Federal Commission on Reconstruction (hereinafter referred to as the commission), which shall be composed of five commissioners, who shall be appointed by the President, by and with the advice and consent of the Senate. Not more than three of the commissioners shall be members of the same political party. The commission shall choose a chairman from its own membership. Any commissioner may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. A vacancy in the commission shall not impair the rights of the remaining commissioners to exercise all the functions of the commission. The commission shall cease to exist two years after the cessation of hostilities of the existing war unless otherwise provided by Congress.

Sec. 2. That each commissioner shall receive a salary at the rate of \$10,000 a year. The commission shall appoint a secretary, who shall receive a salary at the rate of \$5,000 a year, and the commission shall have authority to employ and fix the compensation of such economists, investigators, special experts, clerks, and other employees as it may from time to time find necessary for the proper performance of its duties. Until otherwise provided by law, the commission may rent suitable offices for its use.

Sec. 3. That it shall be the duty of the commission to examine into the problems and conditions that are arising out of the war and that may arise out of the transition of the economic, industrial, and social life of the Nation from a state of war to a state of peace; and with a view of meeting, as far as possible, such problems and conditions before their solution is actually forced upon the Government, the commission shall report to Congress from time to time the results of such investigations with recommendations for new and additional legislation.

Sec. 4. That it shall be the duty of the commission to investigate and report as above described on any and all questions that may be referred to it by the Senate or the House of Representatives or by the President arising out of the conditions of war above described; and more particularly it shall investigate and report on the following problems:

- (a) The financing, regulation, control, and development of the merchant marine.
- (b) The development, regulation, expansion, and direction of foreign trade.
- (c) The reorganization, financing and readjustment of industries engaged in war work by way of reconverting them to normal production.
- (d) Technical education and industrial research as a means of developing and strengthening of industry.
- (e) The redistribution and employment of labor in agricultural and industrial pursuits and the problems of labor growing out of demobilization.
- (f) The supply, distribution, and availability of raw materials and foodstuffs.
- (g) The conservation and development of national resources.
- (h) Inland transportation by rail and water.
- (i) Communication by telephone, telegraph, and wireless.
- (j) The reorganization of Government departments, bureaus, commissions, or offices, with a view to putting the Government on an economical and efficient peace basis.
- (k) The consolidation of such acts and parts of acts of Congress which relate to the same subject matter, but which now appear at various places in the statutes.

Sec. 5. That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$500,000, or so much thereof as may be necessary to carry out the provisions of this resolution.

Sec. 6. That this act shall take effect immediately upon its adoption.

### Senator Overman's Statement

"We all hope the war will be over before very long," said Senator Overman in presenting the measure. "I find that England has appointed several committees, with a view of dealing with this matter in that country after the war, such as the Royal Commission, the Industrial Development Committee, the Belgian Trade Committee, the Committee on Trade Relations after the War, the Commission on Industrial Policy after the War, and a list which I hold in my hand shows the appointment of all kinds of commissions by France, also for the purpose of looking into the questions of trade and finance after the war. I have prepared this bill with that end in view."

The Republican conference of the Senate voted unanimously to urge speedy action on Senator Weeks' resolution, which so far has not been referred to any committee. Senator Lodge, of Massachusetts, chairman of the Republican conference, appointed Senators Watson of Indiana, Poindexter of Washington, and Cummins of Iowa as a special committee to hurry action on the Weeks resolution. At the same time Congressman Madden of Illinois, Republican, introduced a duplicate of the Weeks bill in the House of Representatives and announced that he would urge its passage there.

W. L. C.

### Low Phosphorus Pig Iron in Canada

Production of high-grade low-phosphorus pig iron from shell turnings and other steel scrap in electric furnaces is becoming more and more important as a factor in the pig iron industry in Canada. There are now six plants operating in the country and others are being constructed. Experiments in connection with the production of pig iron in electric furnaces was begun in December, 1916, and production in quantity was started soon afterwards. Although in 1917 production by this method was not large in proportion to the entire output of Canada, it was sufficient to make the year's production larger than for the preceding 12 months. It would have been impossible otherwise to equal the 1916 total, owing to the falling off in blast-furnace production. Production of pig iron by electric furnaces was estimated at 15,000 tons for 1917, based on incomplete reports, and for 1918 it will easily double that amount. Further expansion in production would be undertaken if sufficient power were now available in the Niagara district. R. Turnbull of the Turnbull Electro Metals, Ltd., St. Catharines, Ont., who is a pioneer in this phase of industry, in describing the extent of operations at present, intimated that large possibilities are likely to open up after the war.

The new plate mill of the Youngstown Sheet & Tube Co. produced 12,913 tons in September, a gain of nearly a thousand tons over the August output.

# Slight Increase in Iron and Steel Exports

August Makes Better Showing Than July, but Falls Behind August, 1917—Needs of War Clearly Shown in More Products—Machinery Exports Increase

WASHINGTON, Oct. 8.—The exports of iron and steel in August, 1918, show an increase of 12 per cent over the July figures and almost 20 per cent over the June figures. But they are still below the figures for the same month of last year. The excess reported in July over the corresponding month of 1917 seems to have been isolated, for the August figures dropped again below the totals for August, 1917. The exports for August, 1918, were 511,858 gross tons, compared with 522,810 tons in August, 1917. For the eight months ending August, 1918, the decline is more marked. In that period the total exports of iron and steel were 3,669,775 gross tons against 4,036,456 tons in the first eight months of 1917. This is practically at the same rate of decline shown by the fiscal year of 1918 in comparison with the fiscal year of 1917. The detailed figures of the iron and steel exports show some drastic decreases. The pig iron exports fell from 62,083 tons in August, 1917, to 26,028 tons in August, 1918. Exports of scrap fell from 6761 tons to 71 tons.

The steel rail exports increased from 24,698 tons in August, 1917, to 42,542 tons in August, 1918. The lion's share of this increase went to France for the use of the American Expeditionary Forces. It is necessary to keep the railroads up as close as possible to the front, and this increase in rail shipments will probably continue for several months. The exports to France out of the August total were 15,885 tons; Canada got 7787 tons, Cuba 5829 tons and Japan 4178 tons.

An even more striking increase, although easy to trace to war effects, is the jump in the export of barbed wire from 5817 tons in August, 1917, to 35,172 tons in August, 1918. Of the latter amount, 22,699 tons were sent to France and 8546 tons to Italy. There was a slight increase in exports of other types of wire

from 12,138 tons in August, 1917, to 15,544 tons in August, 1918. Of these exports, France received 3240 tons, Canada 2183 tons, Argentina 2234 and Japan 3064.

Of the steel plate exports, which rose to 52,395

Exports of Iron and Steel

|   | August     |            | Eight Months |            |
|---|------------|------------|--------------|------------|
|   | 1917       | 1918       | 1917         | 1918       |
|   | Gross Tons | Gross Tons | Gross Tons   | Gross Tons |
| Ferromanganese .....                            | 453        | 284        | 1,082        | 3,170      |
| Ferrosilicon .....                              | 1,141      | 871        | 3,208        | 3,104      |
| All other pig iron .....                        | 60,489     | 24,873     | 90,161       | 137,905    |
| Scrap .....                                     | 6,761      | 71         | 134,784      | 1,679      |
| Bar iron .....                                  | 2,306      | 5,707      | 36,462       | 33,861     |
| Wire rods .....                                 | 20,577     | 9,580      | 99,681       | 95,788     |
| Steel bars .....                                | 48,810     | 47,819     | 423,201      | 419,209    |
| Billets, ingots and blooms, n. e. s. ....       | 189,083    | 189,851    | 1,329,708    | 1,311,902  |
| Bolts and nuts .....                            | 2,736      | 2,147      | 202,835      | 17,095     |
| Hoops and bands .....                           | 4,685      | 3,988      | 36,616       | 35,975     |
| Horseshoes .....                                | 1,495      | 73         | 3,113        | 2,245      |
| Cut nails .....                                 | 453        | 347        | 2,416        | 2,954      |
| Wire nails .....                                | 10,552     | 5,242      | 64,444       | 53,685     |
| All other nails, including tacks .....          | 874        | 1,032      | 13,023       | 7,419      |
| Cast iron pipes and fittings .....              | 5,775      | 2,460      | 47,893       | 45,927     |
| Wrought pipes and fittings .....                | 10,862     | 8,620      | 85,575       | 60,928     |
| Radiators and cast iron househeating boilers .. | 188        | 215        | 4,017        | 1,451      |
| Wood screws .....                               | 129        | .....      | 580          | .....      |
| Railroad spikes .....                           | 843        | 1,008      | 12,808       | 7,011      |
| Steel rails .....                               | 24,698     | 42,542     | 338,592      | 282,270    |
| Galvanized iron sheets and plates .....         | 7,822      | 5,498      | 57,970       | 50,904     |
| All other iron sheets and plates .....          | 5,738      | 4,371      | 39,375       | 30,965     |
| Steel plates .....                              | 49,802     | 52,395     | 355,498      | 331,186    |
| Steel sheets .....                              | 11,576     | 13,486     | 93,628       | 120,222    |
| Ship and tank plates, punched and shaped ..     | 1,627      | 656        | 3,044        | 21,188     |
| Structural iron and steel ..                    | 19,418     | 20,300     | 201,312      | 153,010    |
| Tin and terne plates .....                      | 15,962     | 17,706     | 116,460      | 192,172    |
| Barbed wire .....                               | 5,817      | 35,172     | 109,915      | 144,847    |
| All other wire .....                            | 12,138     | 15,544     | 129,058      | 102,543    |
| Total .....                                     | 522,810    | 511,858    | 4,036,456    | 3,669,775  |

Exports of Machinery

|   | August       |              | Eight Months  |               |
|---|--------------|--------------|---------------|---------------|
|   | 1917         | 1918         | 1917          | 1918          |
| Adding machines .....                                       | \$153,806    | \$255,214    | \$1,492,403   | \$1,242,394   |
| Air-compressing machinery .....                             | 56,918       | 296,855      | 648,457       | 1,697,657     |
| Brewers' machinery .....                                    | 22,738       | .....        | 95,096        | 83,776        |
| Cash registers .....  | 32,197       | 101,726      | 619,090       | 433,459       |
| Parts of .....  | 5,208        | 7,889        | 57,135        | 46,663        |
| Concrete mixers .....                                       | 9,479        | 30,226       | 23,844        | 228,112       |
| Cotton gins .....   | 5,402        | 1,006        | 64,429        | 75,341        |
| Cream separators .....                                      | 25,640       | 57,188       | 456,093       | 531,934       |
| Elevators and elevator machinery .....                      | 82,869       | 258,426      | 1,400,804     | 1,252,529     |
| Electric locomotives .....                                  | 2,253        | 5,502        | 322,306       | 72,270        |
| Gas engines, stationary .....                               | 20,223       | 52,690       | 579,164       | 328,850       |
| Gasoline engines .....                                      | 212,218      | 2,688,370    | 2,398,925     | 24,760,079    |
| Kerosene engines .....                                      | 198,298      | 284,192      | 406,405       | 4,945,089     |
| Steam engines .....   | 2,564,329    | 2,503,629    | 17,952,107    | 22,774,717    |
| All other engines .....                                     | 112,054      | 301,280      | 3,047,173     | 2,928,809     |
| Parts of .....  | .....        | .....        | 9,287,245     | .....         |
| Boilers .....   | 294,890      | 464,044      | 506,644       | 2,898,612     |
| Boiler tubes .....  | 557,839      | 554,527      | 1,039,377     | 3,631,653     |
| All other parts of engines .....                            | 1,767,909    | 3,168,902    | 2,634,959     | 16,814,990    |
| Excavating machinery .....                                  | 58,369       | 113,807      | 85,052        | 939,805       |
| Milling machinery, flour and grist .....                    | 39,691       | 45,001       | 521,354       | 913,508       |
| Laundry machinery, power .....                              | 25,967       | 42,435       | 294,059       | 308,436       |
| All other .....   | 31,548       | 6,067        | 175,268       | 151,323       |
| Lawn mowers .....   | 7,121        | 7,809        | 144,747       | 181,277       |
| Metal-working machinery, including wood-working tools ..... | .....        | .....        | 44,604,259    | .....         |
| Lathes .....  | 1,621,168    | 606,606      | 3,181,002     | 7,056,695     |
| Other machine tools .....                                   | 785,685      | 859,142      | 1,555,120     | 7,335,108     |
| Sharpening and grinding machines .....                      | 406,670      | 552,107      | 848,712       | 4,430,488     |
| All other metal-working machinery .....                     | 1,771,683    | 1,891,882    | 3,701,011     | 16,337,377    |
| Meters, gas and water .....                                 | 26,270       | 29,219       | 323,351       | 252,871       |
| Mining machinery, oil well .....                            | 95,212       | 488,192      | 891,059       | 1,607,216     |
| All other .....   | 946,613      | 933,109      | 7,306,583     | 6,278,434     |
| Paper-mill machinery .....                                  | 199,259      | 137,659      | 1,282,690     | 1,117,452     |
| Printing presses .....                                      | 208,833      | 181,543      | 1,134,272     | 888,226       |
| Pumps and pumping machinery .....                           | 463,667      | 517,887      | 3,977,294     | 4,036,535     |
| Refrigerating and ice-making machinery .....                | 114,857      | 145,403      | 775,482       | 852,956       |
| Road-making machinery .....                                 | 22,118       | 42,597       | 52,169        | 389,198       |
| Sewing machines .....                                       | 444,460      | 549,404      | 5,068,192     | 4,850,168     |
| Shoe machinery .....  | 87,196       | 106,220      | 1,011,203     | 848,539       |
| Sugar-mill machinery .....                                  | 702,831      | 685,566      | 4,536,450     | 5,217,421     |
| Textile machinery .....                                     | 283,456      | 587,636      | 2,181,841     | 4,395,593     |
| Typesetting machines .....                                  | 92,394       | 76,123       | 778,676       | 787,387       |
| Typewriting machines .....                                  | 527,086      | 584,257      | 6,706,204     | 4,802,405     |
| Windmills .....   | 78,123       | 90,711       | 715,531       | 516,725       |
| Woodworking machinery, saw mill .....                       | 61,178       | 80,795       | 411,164       | 653,665       |
| All other .....   | 58,331       | 93,118       | 711,834       | 650,660       |
| All other machinery and parts of .....                      | 2,912,441    | 4,097,504    | 26,971,293    | 27,748,933    |
| Total .....   | \$18,196,475 | \$24,580,775 | \$162,977,581 | \$188,245,785 |

gross tons in August, 1918—against 48,802 tons in August, 1917, 11,806 tons were sent to France, 6247 tons to Italy, 9265 tons to the United Kingdom and 14,408 to Canada. Canada also received 3095 tons of steel sheets and 9087 tons of structural iron and steel.

*Imports of Iron and Steel*

|                              | August     |            | Eight Months |            |
|------------------------------|------------|------------|--------------|------------|
|                              | 1917       | 1918       | 1917         | 1918       |
| Gross Tons                   | Gross Tons | Gross Tons | Gross Tons   | Gross Tons |
| Ferromanganese               | 2,840      | 3,743      | 35,473       | 26,169     |
| Ferrosilicon                 | 654        | 167        | 6,887        | 1,730      |
| All other pig iron           | 2,296      | .....      | 12,749       | 1,953      |
| Scrap                        | 11,213     | 3,568      | 161,789      | 29,895     |
| Bar iron                     | 402        | 295        | 1,905        | 1,283      |
| Structural iron and steel    | 1,063      | 173        | 2,745        | 1,800      |
| Steel billets without alloys | 5,615      | 2,548      | 25,905       | 20,873     |
| Steel billets                | 661        | 5,489      | 4,908        | 5,214      |
| All other steel billets      | 1,174      | 740        | 5,495        | 4,143      |
| Steel rails                  | 92         | 55         | 1,192        | 1,304      |
| Sheets and plates            | .....      | .....      | 124          | 32         |
| Tin and terne plates         | .....      | .....      | .....        | .....      |
| Tin scrap                    | .....      | 605        | .....        | 4,157      |
| Wire rods                    | 111        | 683        | 313          | 6,535      |
| Total                        | 26,121     | 18,066     | 259,485      | 105,088    |

*Imports of Manganese Ore and Oxide*

|                         |        |        |         |         |
|-------------------------|--------|--------|---------|---------|
| Manganese ore and oxide | 87,650 | 33,975 | 457,878 | 308,697 |
|-------------------------|--------|--------|---------|---------|

The valuation of the total exports of iron and steel—because of the higher prices—rose from \$90,925,829 in August, 1917, to \$97,111,045 in 1918. For the eight months ending August, 1917, these values total \$804,515,257, and for the same period ending August, 1918, they aggregated \$706,006,369.

The machinery exports for August, 1918, showed a decided increase—practically 50 per cent. These figures rose from \$18,196,475 in August, 1917, to \$24,380,775 in August, 1918. A large share of this was due to an increase in the export of gas engines—which includes automobiles—from \$212,218 last year to \$2,688,370 this year.

For the eight months ending August, 1918, the exports of machinery aggregated \$188,245,785 against \$162,977,581 a year ago.

The imports of iron and steel continue to fall. This is largely due to shipping embargoes and the demand in Europe for whatever iron and steel imports are available for commerce. The United States is able to take care of most of its own needs of raw materials and has had to cut down on other items. In August, 1917, these imports totaled 26,121 tons. In August, 1918, they were 18,066 tons. For the eight months ending August, 1917, they were 259,485 tons, but fell to 105,088 in the same period of 1918.

This decrease in imports is even more dramatically shown by the decline in the importations of manganese ore and oxide of manganese. In 1917 there were imported 87,650 tons of this material, while in August of the present year importations were only 33,975 tons. For the eight months ending August, 1917, they totaled 457,878 tons, but fell to 308,697 tons for the same period of this year.

### Chrome Ore in North Carolina

The Southern Minerals Corporation has recently been organized and incorporated in North Carolina with offices at 42 Broadway, New York. E. Cowper-Thwaite is president, and C. B. Stowe vice-president. The company has leased about 200 acres in Yancy county, western North Carolina, where it states it has in prospect large deposits of dunite carrying chromite in varying percentages.

Numerous lenticular veins of solid chromite have been found, one in particular developing from 3 in. at the surface to 17 in. at 60-ft. depth, while the entire dunite formation which runs through the company's leases, promises to average better than 6 per cent chromic oxide, thus presenting good opportunity for a concentrating operation.

The company is, at present, installing drills for mining on a substantial scale by the open quarrying. Ore analysing as high as 50 per cent  $\text{Cr}_2\text{O}_3$  is stated to have been mined and shipped. The prospects in this district for chromium and other minerals are believed to be bright. Some years ago, this territory was slightly developed, but then lost sight of.

### A Portable Vibrating Foundry Riddle

An interesting type of power riddle, which can be brought directly to the point in the foundry at which sand is to be sifted, has been brought out by the Maroa Mfg. Co., Maroa, Ill. The riddle weighs only 115 lb. and can thus be easily carried from place to place or moved about readily by suspending it from a small cable, rod or other form of overhead track. The principle of operation differs from that generally employed, inasmuch as the screen has a vibrating motion and not a gyrating or reciprocating one. It is pointed out that the riddle remains stationary while in use, and as soon as the current is turned on the riddling of the sand begins and continues until the current is switched off. As the riddle is without legs, it is possible to suspend it directly over the work and sift the sand upon it.

The riddle consists of a hopper to receive the sand, the screen and the mechanism for imparting motion to the latter from the driving motor. In operation sand which does not necessarily have to be thoroughly dry, it is explained, is placed in the small hopper. This will hold several shovelful of sand, and the flow from the hopper to the screen can be controlled by a slide valve in the former if desired. When this valve is properly adjusted, the sand can be handled as fast as one man can shovel it into the hopper. The screen upon which the sand falls has a vibratory motion imparted to it by a tapper which receives power through a short belt from the  $\frac{1}{4}$ -hp. driving motor. This motion, it is explained, causes the sand to sift through the meshes of the screen while the refuse is discharged at the end, thus enabling the riddle to be used to full capacity at all times since it is unnecessary for the man shoveling the sand to stop and remove the riddle to get rid of the refuse. In operation the machine is motionless, thus enabling sand to be riddled directly over the work. It is also possible to have the riddle start to work as soon as the current is turned on and stop when the electric power circuit is opened.

The screen is bound with iron and is mounted on felt. While the wear is stated to be small, if it becomes necessary to renew the wire, all that has to be done is to clip the heads of several rivets and take out the wire. After a new screen is put in place it is riveted in position. The bearings and other moving parts of the riddle are located above the movement of the shoveler so that sand cannot be accidentally spilled on the bearing.

An interesting report on the results of safety work at the plant of the Commonwealth Steel Co., Granite City, Ill., has just been made by L. W. George, safety engineer of the plant. The report shows that during the last nine months with a payroll of \$2,250,000 the company has had to pay less than \$6,000 or approximately one twenty-fifth of one per cent as compensation for the death and injury of workmen. It is pointed out that the average premium for insurance against industrial accidents is 2.05 per cent of the payroll. In the case of the Commonwealth Steel Co., a premium of 2.16 per cent of the payroll was paid for insurance prior to the institution of a safety department. The company employs 2350 workmen.



Suspending a Portable Foundry Riddle from a Cable or Overhead Track Enables It to Be Moved Wherever Sand Is to Be Sifted. This Action Being Accomplished by a Vibrating Motion of the Screen



# Putting Women Into the Machine Shop

Short Probationary Period Successful in  
Cleveland Plants—Qualities in Which  
Women Excel—Reduced Labor Turnover

—BY F. L. PRENTISS—

THE change from man to woman labor presents new problems to those plant managers who are just starting to employ women or who, impelled by the necessity of a labor shortage, are planning to replenish their dwindling ranks of employees with female help. One question that comes uppermost to the minds of plant managers and employment departments is how far it is practical to go in training and depending on women to fill the places of men in doing work that requires more skill and experience than the most simple machine operations? Another question is what changes must be made in the organization to provide for the management of women, or in other words how should women employees be handled? Other problems are the hours of work and rest periods.

Two Cleveland plants that are now using a large number of women on munition and other machine work, the American Ball Axle plant of the Standard Parts Co. and the plant of the American Multigraph Co., have worked out interesting solutions of these problems.

## The Standard Parts Co.'s Employment of Women

Not a woman was employed in the shop of the former until a few months ago. Now out of 1000 employees about one-fourth are women who do light machine work, including work of close dimensions and difficult operations on lathes up to 32 in. in size, drill presses, both hand and automatic screw machines, and milling machines on shell and motor truck parts. Girls are also employed on bench work in assembling shell and axle parts and for inspection work and have taken the places of young men as timekeepers, transfer clerks, planning clerks and supervisors of material in the process of manufacture. Some are being fitted for toolroom work and will probably be found in this department shortly. Over 75 per cent are engaged on piece work and all the women employees with the men are under a service bonus plan.

When the employment managers of the two plants were asked from what classes they secured their women workers, their replies were almost identical. The women employees include college graduates, school teachers, stenographers, single and married women who work not from necessity but from choice, happy in the thought that they are able to do their part in winning the war. In fact, many have gone into the shops purely because of patriotic motives, the desire to help being stimulated in many cases by the fact that they have husbands or other relatives at the front.

## Supervision of Female Workers

The routine handling of a large number of women in a shop is found to be more difficult than for a like number of men. In both plants women have therefore been entrusted with the management of the women employees. This plan has been found to give satisfactory results. "A woman's mind is strange and complex, but their female characteristics are intensified many fold when one deals with a large number of women instead of

with a single individual," was the view expressed by the employment manager of one of the plants.

## England's Experience Not Applicable

The employment manager of the Standard Parts plant read various books on the handling of women in the English munition plants but laid these aside and proceeded to work out the problems as they arose in his own plant. The first 25 women employed at the American Ball Axle shops were obtained through newspaper advertising. Since then the additions to the working force have been secured through the girls already employed. Each employee on an average has four friends who want to work in the plant, after hearing stories about the good treatment shown the girls and the amount of their earnings. This makes somewhat an endless chain of applicants.

Employment is in charge of a girl who is in the capacity of an assistant employment manager with full authority to employ female labor. The requirements of the applicants are that they have good health, can read and write the English language. Preference is given to girls who are recommended by someone in the plant. Girls down to 18 years of age are employed. No maximum age limit is set, although it is felt as a general proposition, that after women reach about middle age it is a slower task to break them into the work. New girls are put on the kind of work they appear best fitted for.

## Hours of Work

The women work in three 8-hr. shifts, from 7 a. m. to 3 p. m., 3 to 11 p. m. and 11 p. m. to 7 a. m. with  $\frac{1}{2}$  hr. for lunch, making their actual working time  $7\frac{1}{2}$  hr. Time, motion, and fatigue studies determine the piece-work price, the amount of time allowed for rest in each working shift, and the frequency of the rest period. On some work a 5-min. period is allowed each hour, and on other work as high as 10 min. is allowed per hour. The girls bring their lunches and are served with hot coffee free of charge in the factory lunchroom. The company is now planning to install a complete restaurant.

The women employees are under a general forelady, one for each shift. Complaint as to wage rates, working conditions and grievances against co-workers can be taken over the forelady's head to the woman assistant employment manager who represents the plant manager in dealing with the problems of the female personnel. Under this arrangement practically full supervision of the women is entrusted to women. A matron is provided in the rest room and a trained nurse in the dispensary. The women employees have their own factory entrance and a separate waiting room is being fitted up for the girl applicants.

## Probationary Period

When a girl is hired she goes on a probationary period of six weeks and is given a minimum pay rating for two weeks, this varying according to the season of the year. At the expiration of the two weeks and of the four weeks her

pay is advanced, provided she makes satisfactory progress. At the end of six weeks she is assigned to a machine at a piece-work wage.

The machinery in each department is graded according to the difficulty of its operation. A new girl is assigned to the simplest machine in the department known as the training machine. Here she is under the instruction of the general tool setter of the department who ranks next to the foreman. After about 30 min. instruction she starts on her work.

#### Progress of Training

Girls employed in the lathe department, for example, are put successively on speed lathe work, small engine lathes, large engine lathes, low-swing lathes, and automatic turret lathes. It is stated that after six months experience they become thorough mechanics on lathe work and are capable of doing tool work. During this six months shop experience many have done work of dimensions closer than tool work. It is claimed that the girls

are able to make the taper cut on a truck axle part after three weeks experience, two of which are spent in roughing work. A girl operates a single spindle Cleveland automatic machine on a cartridge container made from 2¼-in. bar stock. On the drill presses the girls drill from 1/6 in. to 3-in. holes in small parts for military truck axles, shell parts, cartridge containers and booster jackets for trench mortar shells. They operate horizontal, end multi-cut, straddle, and vertical milling machines, performing various operations including dividing head work on truck axle parts. One of the difficult milling operations they do is the milling of a square surface on a steering knuckle within limits of 0.001 in. They thread, tap, ream and bore axle and shell parts and machine gun tripods on hand screw machines in all sizes.

#### Women as Inspectors

Inspection work done by them includes raw material, floor, and final inspection of shell and axle parts. For this inspection they are trained



Some of the 125 Women Operators of Milling, Drilling and Special Machines on Fuse Parts at Work in the American Multigraph Co. Plant

are qualified to operate lathes of any of these types in a shorter period than six months, but in a shorter period would not have the thorough training that is given them on all lathe work.

#### Accomplishments of the Women as Machine Operators

Of the girls now employed 65 are working on drill presses of from 1 to 16 spindles, 35 on milling machines, 12 on hand screw machines, 30 on lathes, 10 on speed lathes, 4 on low-swing lathes, 3 on automatic milling machines and 1 on an automatic screw machine. That more girls have not already been put on the automatic machines is because of the company's policy not to replace with girls men already employed. Fifteen girls are engaged on bench work in filing, fitting, reaming, tapping and assembling axle parts. A similar number are employed in painting and assembling trench mortar shells. Girls operate lathes up to 32-in. swing, doing threading, taper work, roughing and finishing on shell and axle parts. They

to read blueprints, and micrometers, verniers, Brinnell machines and scleroscopes.

The girl employees are trained rapidly in setting up and become experienced tool setters after 4 months experience. The Ohio law that forbids women from operating emery wheels prevents the girls, however, from handling tool setting. A man tool setter, who sets up and checks the job, and grinds the cutting tools, is therefore employed in each department.

There is a differential in the day rate for the men and women due to the fact that the men are put on work that requires a greater degree of muscular work than the women. The piece-work rate is the same for both. A man is not replaced with a woman, but if a girl after training can handle the piece-rate job, she takes the place vacated by a man at the same piece rate.

The women are found to learn quicker than men, take greater pains and to be as good on production work as men, even on difficult work. In

fact, they appear equal to the men on all classes of the lighter machine work that do not require the experience of long machine shop training. The labor turnover among the women is less than among the men.

#### Scope of the American Multigraph Co. Plan

The American Multigraph Co. now employs 1200 women on munition work. Men to the number of 700 are still used on the heavier and more difficult machine operations. This change from man to woman labor has been made as rapidly as possible without important changes in the plant organization and with factory operations continuing during the labor replacement without serious interferences with the production which the management has aimed to keep at the maximum.

This company began making munitions in 1915 when it took an order for timing precision fuses for England and Russia, and as soon as our country entered the war it went into munition work far more extensively, taking large Government orders for the metal parts for fuses for 75-mm. shells. It first employed girls on shell work three and one-half years ago when it started with not over 50 women employees. It is only within the past few months, however, that the women have almost entirely replaced men in some departments. Most of them are employed on inspection and assembly work. Since the draft has thinned the ranks of the male workers, women have also taken their places on light machine work, and the substitution has proved very satisfactory from a production standpoint.

At present about 125 women are engaged in operating machines, mostly on hand screw machines, Nos. 2, 4 and 6, single-spindle and three-spindle drilling machines, small milling machines, thread-milling machines and machines designed for special operations on fuse parts. While this machine work is of a light character, some of the operations are quite difficult. Automatic screw machines are still operated exclusively by the men, but as the girls become more experienced on machine work and with the further depletion of the man power the company may later decide to place women on the automatic machines.

The women are employed in two 8-hr. shifts, the first from 6.30 a. m. to 3 p. m. and the second from 3 to 11.30 p. m. Each shift has a 30-min. lunch period and during each 4-hr. work period a 10-min. rest period. As the work is of a light character severe physical exertion is not required, but rest periods are found advisable in order to afford the women a slight relaxation.

#### Where Women Workers Excel

The employment of women has proved very satisfactory on machine work as well as on assembling and inspection. The company finds that they are fully as efficient as the men, better suited than the men in handling small parts in assembling and inspection work because of their deftness and dexterity, more dependable, have no more spoils, and have a greater appreciation of the fact that we are at war.

While the men work to earn their wages the women generally display a more patriotic spirit and realize that they are a part of the war organization and are doing their part to win the war. When plant operations necessitate changing girls from one class of work to another paying a lower hourly rate, it is stated that they submit to the reduction in pay without complaint and work just

as faithfully at the lower wages until they are restored to better-paying places.

#### Women Not Segregated

No attempt has been made to segregate the women from the men. All those on machine work are employed in the same section of the plant as the men, frequently on adjoining machines. The presence of both sexes in the same room apparently has a beneficial effect on the men, as the latter are less inclined to boisterousness. As very few men are engaged in inspection work the women have the inspection department pretty much to themselves.

The women are all paid an hour rate without special incentive for maximum effort except in the fuse assembly department where the 14 fuse parts are assembled by gangs and where a bonus system has recently been placed in effect, a bonus being paid for each fuse assembled, beyond a certain daily minimum. Women are paid the same wages as the men for the same work.

Two forewomen are employed, one over the day force, the other over the night force. Over each inspection table at which about 12 girls work, there is a woman patrol inspector. These patrol inspectors are chosen from the ranks of the girl inspectors, those who have proved unusually competent being promoted to this supervision work. A check of the amount of work each girl does is kept by counting her output. On a large blackboard in the inspection room is posted the number of fuses that should be produced each day, the number the day before, the total for the month, and the excess over the schedule. This stimulates the girls to maximum effort.

#### Little Plant Change Required

Further than the fitting up of a convenient room for women with adequate restroom and toilet room facilities and a special locker room, the substitution of women for men necessitated little change in plant arrangements. A restaurant was recently provided, and in this the men and women eat at the same time. It has a seating capacity of 300, and the women go to lunch in three shifts. The menu provides a sufficient variety of food to choose from and the charge is less than cost.

The inspection department occupies a large part of the top floor which is well supplied with daylight from above as well as from the windows. In addition to the usual ventilation, electric fans are provided above the workers' heads.

#### Advertising in Daily Papers for Women Workers

The employment of women is in charge of the regular shop employment office. No previous machine-shop experience is required. Few of the women employees are found to have previously done any work in a shop. Those put on a day shift are 18 years and up in age, and those working nights are 21 years old and over, these minimums being required by law.

Applicants are secured through liberal display advertisements in the daily newspapers, usually on Sunday. The advertisements are prepared in a form that will appeal to a woman's patriotism, urging her to join the industrial ranks and "back up the boys in the trenches," at the same time calling attention to the fact that the work is clean, not burdensome, and the surroundings pleasant.

Although there is a heavy demand for women workers in Cleveland shops and many manufacturers resort to the newspaper advertising pages to secure female labor, the kind of appeal made





In Handling Small Parts in Assembling and Inspection, Women by Their Greater Deftness and Dexterity Have Displaced Men

by the advertisements of the American Multi-graph Co. accomplishes its purpose as a half-column advertisement usually brings from 200 to 300 applicants, from whom the most promising are selected. As many as 150 have been engaged in one day.

#### Training Operators Without a Training School

Because of lack of time the company has not established a training school for girls, although it regards such a school as desirable. The women are put to work with the other employees and are found to learn their duties quickly. Those doing

machine work are given instruction either by foremen or another machine operator. Those put on hand screw machines are said to become very efficient in the operation of the machines in a week's time.

During the first two or three weeks after a new lot of girls are employed there is a weeding out, some of the new employees not proving able to do the work and others leaving because the employment does not suit them. After the weeding out, however, it is stated that the labor turnover is less than among the men. In attendance they are found to be prompt and regular.

#### Constant Heating Effect of Portable Lincoln Welder

In the portable arc welding machine built by the Lincoln Electric Co., Cleveland, and illustrated in THE IRON AGE of Sept. 19, the series turns on the generator compound wound fields are connected up so as to oppose the shunt field and therefore the voltage varies from zero when the operator short-circuits the generator in striking the arc up to 20 to 50 volts on no load according to the setting of the control switches. The effect of this progressive rise of voltage with decrease of load is to keep the total watts and consequently heating effect constant during welding with any given switch setting irrespective of the length of the arc. The automatically regulated constant heat and wattage is one of the points on which special emphasis is placed.

#### Iron Buckets for the Army

WASHINGTON, Oct. 8.—The War Department announces that the manufacture of galvanized iron buckets for the Army has begun at Camp Joseph E. Johnston. The Conservation and Reclamation Division at this camp has been converting old scrap galvanized iron collected about the camp, as waste or salvage, into serviceable buckets. The work has been done in the reclamation shops and as it is proving profitable will probably be extended.

#### New Power Station Near Pittsburgh Will Cost \$16,000,000

Announcement has been made that, with Government financial assistance, the Duquesne Light Co., Pittsburgh, will immediately begin the construction of an immense new power station at Cheswick, about 12 miles above Pittsburgh, on the Allegheny river. It is estimated the cost of the new plant, which will have a capacity of about 120,000 kw., will be approximately \$16,000,000, and with the new power plant of the West Penn Power Co., at Springdale, a few miles further up the Allegheny, will give the Pittsburgh district ample electrical power for all purposes. A short time ago the question arose as to whether any further Government contracts would be placed in this district because of insufficient power to handle properly contracts already placed. At both new plants, the fuel problem is met by the fact that there are coal mines immediately adjacent to them. While the new Duquesne plant will not be entirely completed for about two years, it is estimated some of the generating units will be in position and delivering power within four months.

The Langelier Mfg. Co., Arlington, R. I., has notified the trade of a price advance of 15 per cent Oct. 15 on its line of high-speed ball-bearing drilling machines.

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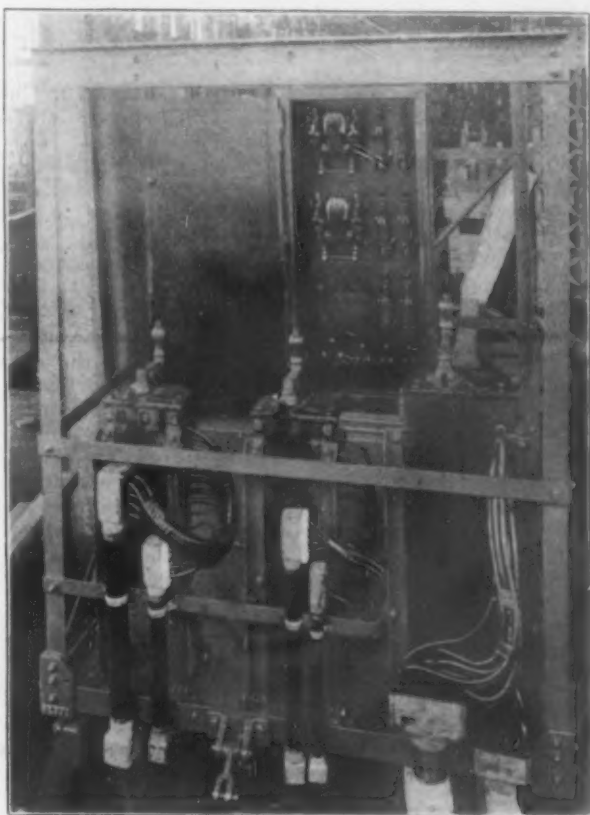
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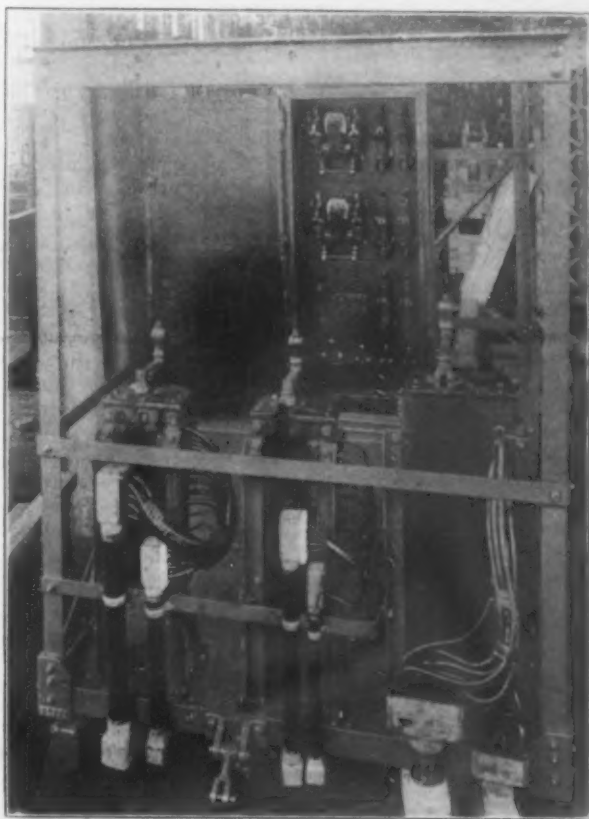
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# Farm Implement Industry Is Curtailed

Use of Iron and Steel Limited by War Industries Board—Committee of Manufacturers Will Work Out Details of Retrenchment

WASHINGTON, Oct. 8.—The Priorities Division of the War Industries Board has ordered a drastic retrenchment in the use of iron and steel by the agricultural implement and farm operating equipment industry. For the year beginning Oct. 1, 1918, the consumption of iron and steel by this industry is cut to three-fourths of the preceding year's total. This is expected to save 500,000 tons of iron and steel—one of the biggest individual savings which has been made by the retrenchment orders of the War Industries Board.

The order is the result of the continual increase in demands of iron and steel by the American Expeditionary Forces in Europe. Other industries will probably receive similar curtailment orders. According to the statement issued by Judge Edwin B. Parker, Priorities Commissioner of the War Industries Board, the farm tractor situation presents one of the most striking illustrations of the necessity for flexibility in the plan for curtailment. The special rulings issued to govern the output of farm tractors, restricts makers who produced less than 10 tractors last year to the production of not more than 10 tractors the coming year; makers who produced and had in field operation 10 and less than 50 tractors may not produce over 50 tractors; makers who produced and sold 50 or more tractors will have their consumption of iron and steel reduced 25 per cent.

## Will Require Signed Pledges

Signed pledges will be exacted from the manufacturers to use materials on hand that may come into their possession for the manufacture of tractors and farm operating equipment and parts, to reduce the tonnage of iron and steel as directed; to comply with the regulations of the Conservation Division of the War Industries Board as to economies and substitutions; and to produce only the more essential farm operating equipment and parts and to distribute the products only for essential uses.

The announcement of Judge Parker declares that the greatly enlarged war program will absorb the greater portion of the iron and steel production of the nation, and that reductions in allotments of iron and steel to industries is necessary to prevent the industrial consumption from obstructing the war program.

"The drive is on," declares the announcement issued by Judge Parker to this industry. "The time is now. When the war shall have been won, we will plan for the future.

## An Indirect War Industry

"Yours is clearly not only an essential but an indirect war industry and will be dealt with as such. The nation must produce a maximum of foods and feeds, but through rigid economies and increased efficiency of the farmers, the dealers and the manufacturers, this production must be accomplished with a reduced consumption of materials and labor required to meet the war program. Speaking generally, the use of modern farm implements conserves labor, but it must be constantly borne in mind that the time element is more controlling now in connection with any conservation program than ever before. The results must be practically immediate in order to contribute to the industrial drive which must sustain the military drive on the battlefields of Europe. The use of a machine, in the manufacture of which large quantities of material and labor are consumed, may be economically sound and in normal times its manufacture and use should be stimulated; but if its production at this crisis requires more labor than will be saved in one season's use, it should—generally speaking—be substituted by

other machines or implements in order to accomplish the immediate conservation of labor and materials.

"Your industry is so large, so varied and so important that the Priorities Division must in the future, as in the past, avail itself of the efficient and patriotic assistance of your Farm Implements Committee in administering the program here outlined. It will also with confidence rely upon the wholehearted co-operation of each member of your industry with such committee and with this division in determining upon a manufacturing program and a basis for the distribution of your products which will result in a maximum conservation of labor and materials and a maximum production of foods and feeds, being assured that when the war shall have been won the problems which now confront us will have been solved."

## Two Periods Named

In its ruling the Priorities Division designates the time from Oct. 1, 1917, to Sept. 30, 1918, as the "First Period" and the year beginning Oct. 1, 1918, as the "Second Period."

"A careful survey of your industry in connection with the urgent war requirements," continues Judge Parker's announcement, "has led to the decision that in the public interest your iron and steel consumption for the second period should be 75 per cent of your consumption during the first period, when it approximated 2,000,000 tons of iron and steel. The effect of a release of 25 per cent of your consumption during the past 12 months will be immediately felt on the war program. It is with confidence that the War Industries Board relies upon your indispensable industry lending the same wholehearted and patriotic assistance in accomplishing these economies that it has always rendered in response to previous appeals. While the importance of your industry and your place in the program for the production of food for this nation and its allies can hardly be overstated, yet the supreme concern at this critical period is that every possible contribution be made immediately and enthusiastically to the end that the war may be shortened and the victory made decisive.

"The necessity of reducing the allotments of iron and steel to your industry places upon you and the Farm Implements Committee the responsibility of so applying the curtailment that your more essential products shall be produced in sufficient quantities to meet all legitimate demands for them and that your less essential products shall be produced in greatly diminished quantities, or not at all. The Priorities Division does not undertake to direct you in the formulation or execution of a program of such responsibility. This is your problem. You are equipped to solve it; and with your experience and ripe judgment you will through team work so adjust your manufacturing program and utilize the curtailed allotment of materials, that the theoretical injury may not prove real.

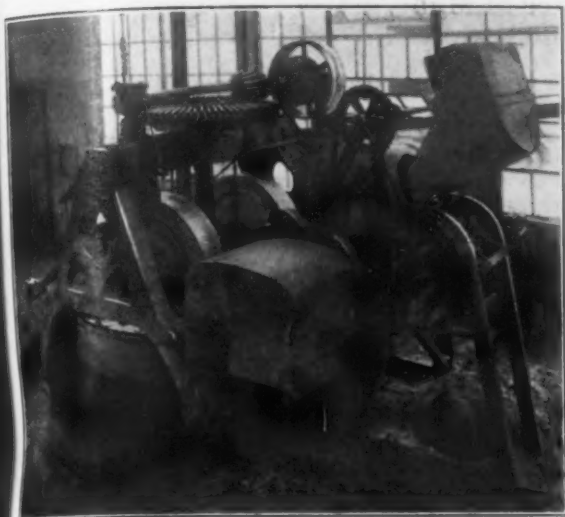
The H. Koppers Co., will begin work shortly on a by-product plant for the Pittsburgh Crucible Steel Co., at Midland, Pa. It will be a 100 oven plant with a daily carbonizing capacity of 1800 tons of coal. The gas produced will be used in the steel mills and the tar recovered will find employment as fuel for the open hearth furnaces, while toluol and ammonia secured will go to Government uses.

Freyn, Brassert & Co. have licensed the Pittsburgh Crucible Steel Co. to install and use on the new blast furnace now building at Midland, Pa., a Brassert patented gas washing and drying unit.



## Concrete Mixer as a Foundry Auxiliary

An installation of a concrete mixer as an auxiliary unit to a foundry sand mixer or mill has proved to be successful as a time and labor-saving idea in the plant



Silica Sand and Clay Are Partially Blended in a Concrete Mixer and Discharged Into the Regulation Foundry Sand-Mixing Machine. Thus Reducing the Time Required for the Final Grinding and Tempering

of the Ohio Steel Foundry Co., Springfield, Ohio. This machine is an ordinary concrete mixer made by the Jaeger Mfg. Co., Columbus, Ohio.

Before this mixer was installed, silica sand and clay were shoveled directly in the sand mill, where the entire operation of mixing, grinding and tempering was performed, as is usual with all rotary mixers. During the time required to mix and temper properly, the operators had practically nothing else to do. Under the new system this idle time is utilized for shoveling the different materials into the concrete mixer, where the charge is dry mixed. When the charge in the concrete mixer is dumped into the sand mill, a shorter length of time is required for the final grinding and tempering than before, as all of the work of mixing has already been performed.

In addition to obtaining a more uniform mixture, this foundry, it is stated, has made a saving in time and labor by the use of the auxiliary concrete mixer of about 50 per cent. In other words, it formerly required 24 hr. operation of the sand mill to supply the foundry with the required facing, etc., while now the combination takes care of an increased amount of work in 12 hr.

## Electric Arc Welding in Shipbuilding

Tentative regulations for the application of electric arc welding to ship construction have been issued by Lloyd's Register of Shipping, according to the *Engineer*, London. The decision to authorize this method in substitution of riveting was reached only after extensive experimental work extending over several months.

The main features of these regulations are that the system of welding must be approved, that the process of manufacture of electrodes must be such as to insure reliability and uniformity in the finished article, that operators engaged are specially trained and efficient supervisors of the work provided. Details of construction of the vessels and of the welds are to be submitted for approval. It has been indicated that butt and edge connections are to be lapped or strapped, and, with lapped connections, the breadths of overlaps of butts and seams and the profiles of the welds are to follow regulations which have been embodied in a table, the width of overlap ranging from 2 1/4 in. with plates 0.40 in. thick to 3 in. in the case of plates 1 in. in thickness, the throat thicknesses for similar plates ranging from 0.28 in. to 0.50 in.

## Bucket Loader for Foundry Sand Mixer

For use in connection with the Simpson intensive foundry mixer which was illustrated in *THE IRON AGE*, April 25, 1918, the National Engineering Co., 5 North La Salle Street, Chicago, has brought out a bucket type of loader. The advantages claimed for the use of this arrangement are the securing of the maximum capacity from the mixer, the elimination of hand labor to a large extent and the feeding of the correct amount of sand into the machine.

The capacity of the bucket is the same as that of the mixing machine with which it is used, and as soon as the previous mix has been discharged, the bucket is elevated and the contents discharged into the machine. After the sand has been emptied the bucket is lowered to receive the next charge. The power required to operate the loader is taken from the driving shaft of the mixer itself, the operation being dependent



The Use of an Automatically Operated Bucket Loader Enables a Foundry Sand Mixing Machine to Be Operated Continuously

upon the engagement of a clutch mechanism to raise the bucket. A brake is provided to guard against too rapid descent.

## Asks Technical Societies to Maintain Activities

A. H. Krom, Director of Engineering U. S. Employment Service, 29 South La Salle Street, Chicago, has sent to the presidents of technical societies a letter urging that the officers of the societies exert their official influence to continue the activities which they represent. "Don't be discouraged," he says, "by the fact that your membership is being decreased by enlistments and war demands. Strengthen your organization and keep your members acquainted with matters relating to their welfare and advancement. Originate plans for professional development. Be ready with society service when our heroes return. Now as never before the engineer and the engineering profession are conceded that place in the world's estimation so long coveted and deserved. Carry this wartime recognition into the pursuits of peace by shouldering your share of civic responsibilities and make the society headquarters for such action. I should be glad to have you present this matter properly and as soon as possible at a meeting of your society, and to advise me in regard to any action you take."

# Liberty Loan Subscriptions Are Lagging

Influenza and Overconfidence Blamed for the Poor Showing—Gratifying Results Are, However, Reported in Some Manufacturing Centers

The Liberty loan subscriptions during the past week have not come in as rapidly as had been expected. Two causes usually are assigned, one being the epidemic of influenza in many parts of the country and the other over-confidence as to the result of the war due to the recent good news from the battlefields of the old world. This lagging tendency has been noteworthy in Pittsburgh, New York and nearly all centers, but representatives of the iron and steel industry are very active and are doing their full part toward promoting the great loan.

In the New York district, the first seven business days of the three weeks campaign brought the total subscriptions to \$305,789,300 or 17 per cent of the district's quota of \$1,800,000,000. The Hardware, Metals and Allied Trades Committee, with a quota of \$99,000,000; had obtained subscriptions amounting to \$15,188,250 up to the close of business Oct. 5. The Machinery, Machine Tools and Railway Supplies Committee, with a quota of \$35,000,000 had obtained subscriptions amounting to \$8,502,250.

In the Pittsburgh district, the Jones & Laughlin Steel Co. has taken the lead with a subscription of \$7,000,000. The United Engineering & Foundry Co. has bought \$1,200,000 of bonds, of which amount \$150,000 has been subscribed from Youngstown and Mahoning county. The Edgar Thomson steel works employees, whose quota was \$1,031,000, have exceeded that amount by \$40,000. Wierton, W. Va., held a celebration last Saturday in honor of the passing of the \$500,000 mark in the campaign, more than doubling the community's quota. Employees of the Wierton Steel Co. subscribed \$430,000.

Among the important contributions reported in New York are the following: Westinghouse Electric & Mfg. Co. (itself and employees), \$5,000,000; New Jersey Zinc Co., \$2,000,000; International Nickel Co. (additional), \$1,400,000; Phelps-Dodge Corp., \$1,000,000; American Brake Shoe & Foundry Co., \$830,000; Worthington Pump & Machinery Co., \$514,000; Republic Iron & Steel Co., \$500,000; Railway Steel Spring Co. (additional), \$370,000; Pressed Steel Car Co., \$250,000; Lidgerwood Mfg. Co. and employees, \$200,000; Hillside Coal & Iron Co., \$100,000; National Enameling & Stamping Co., \$90,000; De La Vergne Machinery Co., \$80,000; New Jersey Zinc Co. (officers), \$80,000; J. T. Ryerson & Son, \$50,000; Auto Strop Safety Razor Co., \$50,000.

## Confidence in Washington

WASHINGTON, Oct. 8.—Peace proposals and the spread of the "influenza" epidemic were credited by the Treasury Department officials here with the slow progress of the first week of the fourth Liberty loan campaign. But the fact that only a little more than \$1,000,000,000 of the \$6,000,000,000 to be raised was reported in the figures for the first week has not weakened the confidence of the directors of the campaign that the country's quota will be filled.

Diplomatic channels brought a lot of peace news to Washington which was carefully culled before it was published lest it would dampen the ardor of both campaigners and subscribers. The proposals themselves, however, were such that their publication left no opportunity for withholding them. Treasury officials have asked all who are interested in the loan to emphasize the fact that it is more important than ever that the loan shall be over-subscribed. Even should the present situation lead toward an eventual peace—which most of the public men in Washington deny—it is pointed out that much of this country's strength at the peace table will depend upon the showing of a unanimous support of the Administration, which would

be demonstrated by an over-subscribed Liberty loan campaign.

The influenza epidemic probably interfered more in Washington than in any other city with the progress of the campaign. Practically all public meetings scheduled to boost the loan had to be called off. Theaters and moving pictures have been closed, as have the churches and schools. All of these had been relied upon as important items in the campaign. In the third loan, the Washington theaters played a vital part in giving opportunity for exhortations to subscribe.

Sunday, Oct. 6, had also been scheduled as "Liberty" Sunday in the churches and all the Washington churches had pledged themselves to devote the day to a big drive for the loan. The closing of the churches, of course, made this impossible, nor was the weather such as to permit of outdoor services on any large scale. Instead, a corps of 3,000 campaigners canvassed every home in Washington for bond subscriptions. The totals of this work showed an approximate aggregate of \$4,000,000 in pledges. Secretary of the Treasury McAdoo participated personally in this drive, setting a pace which no one else was able to follow. He corralled a total of \$1,800,000 in subscriptions. He started in with \$1,000,000 from Bernard M. Baruch, chairman of the War Industries Board, added \$500,000 from Eugene Meyer, of the War Finance Corporation, and \$100,000 from J. Leonard Replogle, chief of the Steel Section of the War Industries Board, and for good measure induced President Wilson to subscribe \$20,000. The latter had already bought \$10,000 worth, apparently exhausting his spare change. So Mr. McAdoo sold this \$20,000 worth on the installment plan.

The reports on the industrial campaign, says an announcement of Secretary McAdoo, are encouraging. Industries throughout the country are striving to win the right to fly the honor pennant by obtaining subscriptions from at least 75 per cent of their employees. The Cleveland district leads in this competition, 190 Cleveland city industries reporting 100 per cent subscriptions.

## Chicago District Employees Do Splendidly

CHICAGO, Oct. 8.—One thing demonstrated by the Chicago iron and steel and machinery committees is that employee meetings with bands and other music, clever speakers and plenty of flags and decorations produce fine results, 100 per cent, in fact, in many cases. S. J. Llewellyn, president Interstate Iron & Steel Co., and chairman of the Chicago Iron and Steel Liberty Loan Committee, testifies to this fact, saying that employees everywhere in his district are doing splendidly. Meetings have been held at the plants of the Continental Can Co., Chicago-Symington Corporation, Burnside Steel Co., Joseph T. Ryerson & Son, Ajax Forge Co., Iroquois Iron Co., Federal Furnace Co., Ingalls-Shepard Forging Co., Continental Bolt & Iron Works, and other plants, all with fine results. Up to Saturday, Oct. 5, returns from the big companies themselves were rather slow, but that they would eventually subscribe handsomely was not doubted.

The Industrial Division of Indiana Harbor, City of East Chicago, Ind., wherein are located the plants of the American Steel Foundries Co., By-Products Coke Corporation, Green Engineering Co., Harbison-Walker Refractories Co., Inland Steel Co., Linde Air Products Co., Mark Mfg. Co., Standard Forgings Co., and many others equally well known, on the first day of the drive subscribed \$1,626,500. Sales were made with the accompaniment of bombs, fire crackers, red fire, etc. John W. Lees, general superintendent Inland Steel Co., is vice-chairman of this division. The total subscribed on the first day by all Indiana Harbor was \$1,809,350.

The East Chicago Industrial Division, headed by Charles H. True, general superintendent Locomotive Superheater Co., on the first day subscribed \$949,500. In this division are such plants as the Champion Rivet Co., East Chicago Foundry Co., Edward Valve & Mfg. Co., Graver Tank Works, Hyman-Michaels Co., Hubbard Steel Foundry Co. and Republic Iron & Steel Co. The entire City of East Chicago a "workingman's town," with a population of 35,000, on the first day entered 19,248 subscriptions to the value of \$2,939,800, against a quota of \$1,759,590, the oversubscription being \$1,180,210. No wonder they held a mid'n'ght parade! Col. Walter J. Riley is chairman of the East Chicago Liberty Loan Committee.

Frey, Brassert & Co., engineers, Peoples Gas Building, Chicago, and their employees subscribed \$33,700 for bonds of the fourth issue, and of the four issues the firm itself has taken \$100,000 worth. Other notable subscriptions follow:

Interstate Iron & Steel Co., \$150,000, the company's incomplete total with employees being \$253,000.  
Fairbanks Morse & Co., \$60,000.  
Ajax Forge Co., \$50,000. (Employees, 100 per cent.)  
W. A. Jones Foundry & Machine Co., \$50,000.  
Joseph T. Ryerson & Son, \$700,000 (\$200,000 to be credited to other districts.)  
Whiting Foundry & Equipment Co., \$100,000.  
Armstrong Bros. Tool Co., \$50,000.  
American Car & Foundry Co., \$100,000.  
Underfeed Stoker Co., \$25,000.  
Chicago Malleable Castings Co., \$75,000.  
Independent Pneumatic Tool Co., \$110,000.  
Stewart-Warner Speedometer Co., \$100,000.

Samuel Deutsch, Oh'o Iron & Metal Co., who is looking after the division embracing the scrap iron and steel men, is working hard to round up a big total. Chairman Llewellyn is confident that a big showing will be made as soon as the larger buyers get in action.

E. P. Welles, president Charles Besly & Co., and chairman of the Machinery Division and his assistants have been too busy selling bonds to do much tabulating. The quota of the division is \$6,800,000, and up to the morning of Oct. 4 the bond sellers had written \$4,000,000. Arousing enthusiasm and striking while the iron was hot had produced fine results at plant meetings. A meeting held Oct. 2 at the tractor works of the International Harvester Co. was attended by 3000 persons and as a result of this meeting and others previously held the division is assured of placing \$1,500,000 with the employees at the works.

On Oct. 3 the machinery bond men held a meeting at the Hawthorne plant of the Western Electric Co., where 6000 employees were roused to enthusiasm, the indicated result being another \$1,500,000. Both the Harvester and the Western Electric plants were placed in the Machinery Division. The Marshall & Huschart Machinery Co., dealer in machine tools, subscribed \$50,000 and its employees \$12,000.

### Detroit Progresses Rapidly

DETROIT, Oct. 5.—In the first five days Detroit raised \$8,209,000, or 52 per cent of its quota of \$73,000,000 for the fourth Liberty loan. Including a \$7,000,000 subscription from the Ford interests, a total of \$12,000,000 was reported Friday. Intensive work among the factories of the city has resulted in doubling and even tripling subscriptions from employees, while corporations almost without exception have doubled their purchases over the third campaign.

Leaders of the drive are confident that Detroit will pass its quota before Oct. 10, and the force of 5000 salesmen will keep constantly at work until the \$73,000,000 mark is passed.

Of the subscriptions of the various metal working concerns of more than \$25,000,000, the Henry Ford interests lead with \$7,000,000 of which \$6,000,000 is credited to the Ford Motor Co. and \$1,000,000 to the Ford & Son tractor plant. An additional \$3,000,000 was taken by Ford interests to be distributed among the 30 branches over the country.

The Packard Motor Car Co. and the Lincoln Motor Co. each subscribed \$1,000,000, while Packard employees

added \$863,650 and the Lincoln Motor employees about \$500,000.

Other large subscriptions from the manufacturers and workers in the metal lines include the following:

|                                       |           |
|---------------------------------------|-----------|
| Hudson Motor Car Co.                  | \$877,900 |
| Detroit Shipbuilding Co.              | 650,000   |
| Michigan Alkali Co.                   | 500,000   |
| Great Lakes Engineering Works         | 500,000   |
| Fisher Body Co.                       | 500,000   |
| Cadillac Motor Car Co.                | 450,000   |
| Standard Life & Accident Ins. Co.     | 375,000   |
| Maxwell-Chalmers Co.                  | 300,000   |
| Solvay Process Co.                    | 300,000   |
| Burroughs Adding Machine Co.          | 250,000   |
| Charcoal Iron Co.                     | 250,000   |
| Studebaker Corporation                | 250,000   |
| Detroit Copper & Brass Co.            | 250,000   |
| Timken-Detroit Axle Co.               | 225,000   |
| Continental Motor Corporation         | 200,000   |
| American Car & Foundry Co.            | 200,000   |
| Pittsburgh Shafting Co. and employees | 150,000   |
| Detroit Steel Products Co.            | 150,000   |
| Detroit Copper & Brass employees      | 130,000   |
| Michigan Malleable Iron Works         | 100,000   |
| Detroit Iron & Steel Co.              | 100,000   |
| Michigan Smelting & Refining Co.      | 100,000   |
| Michigan Stamping Co.                 | 100,000   |
| Detroit Steel Casting Co.             | 100,000   |
| J. W. Murray Co.                      | 100,000   |
| Hutchins Car Roofing Co.              | 100,000   |
| Paige Detroit Motor Car Co.           | 100,000   |
| Detroit Stove Works Co. and employees | 100,000   |

### Cleveland Plants Active

CLEVELAND, Oct. 8.—Cleveland started the second week of the fourth Liberty loan drive with total bond sales aggregating about \$25,000,000, or a little less than one-fourth of its quota of \$112,000,000. However, pledges made but not yet converted into actual subscriptions bring the total up to about \$30,000,000. The campaign is being conducted vigorously and subscriptions are coming in freely from the smaller buyers. Many of the larger industrial companies and individuals who are expected to make large subscriptions have not yet announced the amount of bonds they will purchase, and because of this the total is lower than had been hoped for at this stage of the drive. Industrial companies through their shop organizations are making fine records in securing subscriptions from their office forces and plant employees. Already over 300 companies have reported to the industrial sales committee, having supervision over the campaign in manufacturing plants, that they have reached their full quota and have been awarded the 100 per cent honor emblem. The larger subscriptions already reported include the following:

|   |             |
|---|-------------|
| McKinney Steel Co.  | \$2,000,000 |
| American Shipbuilding Co.                                       | 1,100,000   |
| Cleveland Cliffs Iron Co. and Allied Mining and Other Interests | 1,050,000   |
| White Motor Co.   | 1,000,000   |
| Chandler Motor Car Co.  | 300,000     |
| Valley Mold & Iron Corporation, Sharpsville, Pa.                | 200,000     |
| Cleveland Metal Products Co.                                    | 200,000     |
| W. G. Mather  | 150,000     |
| McMyler Interstate Co.  | 125,000     |
| Champion Rivet Co.  | 125,000     |
| R. L. Ireland   | 100,000     |
| Parish & Bingham Co.  | 100,000     |

### Much Enthusiasm in Cincinnati

CINCINNATI, Oct. 5.—At noon to-day over \$25,000,000 had been subscribed in Hamilton county, with many teams to be heard from. Team Q, in whose territory were several machine tool firms went "over the top" first early Friday morning.

Practically all reports indicate that industrial concerns subscribed more than they did of the third loan, and from the number of small subscriptions it is evident that the workmen are taking more interest in the campaign than heretofore. Peace rumors have only served as a stimulus and present indications are that there will be no let-up in the work until the campaign is closed. The presence of Spanish influenza in the city will only retard work to a small extent, as it is not



epidemic and shop meetings have not been prohibited.

In the absence of a complete list of large subscribers, it would be manifestly unfair to mention only a few of them, but the majority of machine tool builders, pig iron and scrap iron merchants are exceeding their subscriptions to previous issues of Liberty bonds.

### Bond Sale Records Broken

While bond sale records are available in but few New England cities, reports from all the industrial centers show that the factories are in most cases far exceeding the high records made in previous sales of Liberty bonds. The percentage of reports of 100 per cent subscriptions is greater and earlier than in previous campaigns and the figures, when issued, will show that patriotism is running high in that section. In some cities the big effort has been set for this week and reports from these places will be a little slow, but the committees are well organized and will profit from their previous experience.

In Hartford, Conn., to Oct. 4 these subscriptions had been reported:

The Colt's Patent Fire Arms Mfg. Co.: 3839 individuals, \$254,300, 12 100 per cent departments.  
The Pratt & Whitney Co.: 3042 employees, \$240,100.  
The Terry Steam Turbine Co.: 240 employees, \$24,500; company subscription, \$100,000.  
The Maxim Silencer Co.: 116 employees, \$11,000.  
The Veeder Mfg. Co.: 87 employees, \$22,000.  
The Hartford Special Machinery Co.: 154 employees, \$28,850.  
The Underwood Typewriter Co.: employees, \$100,000.

In Bridgeport, Conn., to the same date, some of the subscriptions had been:

Bullard Machine Tool Co.: 1307 employees, \$105,300.  
Locomotive Co.: 1533 employees, \$129,450.  
American Graphophone Co.: 2391 employees, \$128,900.  
Curtis & Curtis Co.: 69 employees (100 per cent), \$29,300.  
Bryant Electric Co.: 1295 employees, \$73,850.  
Bridgeport Metal Goods Co.: 126 employees, \$7,750.  
Crane Co.: 422 employees, \$33,800.  
Spring Perch Co.: 140 employees (100 per cent), \$9,000.

In Torrington, Conn., the chairman of the loan committee predicts that on the showing already made by the Union Mfg. Co., Hendey Mfg. Co., Turner & Seymour Mfg. Co., Torrington Co. and American Brass Co. the total subscriptions will show a 50 per cent increase over those for the third loan.

In Bristol, Conn., the indications are that the employees of the New Departure Mfg. Co. will subscribe for at least \$100,000, or \$20,000 more than for the last loan, and the company has subscribed for \$100,000 on its own account. The other Bristol plants are making a similarly good showing, the Sessions Foundry Co. having reported a 100 per cent subscription.

The employees of the Bridgeport Brass Co., Bridgeport, Conn., have voted to use their back pay due them under the recent award of the National War Labor Board for the purchase of bonds. This will amount to nearly \$100,000.

### Buffalo Reports Satisfactory Progress

BUFFALO, Oct. 8.—During the first week of the fourth Liberty loan campaign Buffalo has raised over \$25,000,000 of its \$61,648,000 quota, and the Iron and Steel Committee has secured over \$4,000,000 of its \$7,000,000. Reports from manufacturers and employees are very gratifying. Employees in nearly every plant are averaging \$100 per man, and practically every plant that has so far turned in a final report shows 100 per cent or over of its allotted amount as taken. The Machinery Committee reports that it has already exceeded 50 per cent of its allotment, or \$812,450 of the \$1,500,000 assigned to it. The Sheet Metal Committee had, up to noon Saturday, raised \$375,000 of the \$850,000 apportioned it, and Chairman Roblin of the Scrap Metals Committee reports \$200,000 of its \$325,000 assignment, including three subscriptions of \$50,000 each from the Buffalo Housewrecking & Salvage Co., Michael Hayman & Co., and Morrison & Risman. Chair-

man Selton Weed of the Wholesale and Retail Hardware Dealers' Committee, advises that over 50 per cent of the committee's quota has been raised.

### Milwaukee's Response

MILWAUKEE, Wis., Oct. 5.—The generous response of the metalworking industry of Milwaukee county to the appeal for subscriptions to the fourth Liberty loan has been mainly responsible for the fact that during the first five days of the campaign approximately 60 per cent of the minimum quota has been pledged. The outpouring of money in this campaign thus far has been more liberal than in any of the three previous drives, and it is notable that bond purchases for cash are in larger proportion than before. Among the largest subscriptions derived from the metalworking industry up to this time are the following:

|                             |           |
|-----------------------------|-----------|
| Allis-Chalmers Mfg. Co.     | \$600,000 |
| Kearney & Trecker Co.       | 500,000   |
| Falk Co.                    | 500,000   |
| Harley-Davidson Motor Co.   | 200,000   |
| Filer & Stowell Co.         | 150,000   |
| John Pritzlaff Hardware Co. | 150,000   |
| Ford Motor Co.              | 105,000   |
| Chain Belt Co.              | 100,000   |
| Pressed Steel Tank Co.      | 100,000   |
| Nordberg Mfg. Co.           | 100,000   |

### Birmingham Doing Well

BIRMINGHAM, ALA., Oct. 5.—Upon the conclusion of the first week's work of the Allied Armies, as Birmingham's fourth Liberty loan workers are called, and before the largest iron and steel corporations with their subscriptions had been recorded, Birmingham had raised over half the quota of \$9,350,000. There has been little noise about it, but a businesslike approach to every man with the presumption that he understood his duty and was prepared to do it.

### Youngstown Is Active

YOUNGSTOWN, Oct. 8.—In the first week's canvass Mahoning County, Ohio, rolled up the magnificent total of \$8,000,000 in swinging towards its goal of \$10,848,000. Of that sum, \$5,000,000 has been subscribed by the men in the mills and other wage earners and \$3,043,000 by the companies. A good-sized sum is expected from the Carnegie Steel Co., for its local plants, from the \$40,000,000 subscribed by the United States Steel Corporation. At the coke oven and benzol plant of the Republic Iron & Steel Co., at Youngstown, 24 employees bought bonds for an average per capita of \$418.40. The stationary engineers at the Republic works here came next, purchasing bonds on an average of \$350 each. At noon last Saturday it was announced that employees of the Youngstown Sheet & Tube Co., had bought bonds to the amount of \$2,000,000.

### Liberty Loan Notes

Industrial interests throughout New Jersey are heartily supporting the fourth Liberty loan. Many officials are members of Liberty loan committees in their respective districts and are devoting time and energy to the campaign with desire to far exceed the established quotas for industrial plants and the local communities. Employees of the different works are also active with subscriptions in support of the loan, showing high enthusiasm and determination to surpass the records made in the previous campaigns.

Various works committees have been appointed to handle the fourth Liberty loan campaign at the different industrial plants at Lancaster, N. Y., and vicinity. The chairman of the respective committees for the different plants are: American Car & Foundry Co., Frank Faust; Gould Coupler & Storage Battery Co., John F. Patterson; New York Central Railroad shops, John Parsons; Lancaster Machine & Knife Works, Harold Earle and F. G. Brost; and American Malleables Co., Frank C. Johnston.

Industrial interests at Philadelphia and vicinity are

showing up strong in the campaign for the fourth Liberty loan. The initial subscriptions include a total fund of \$345,850 from the Metal Working Industries Committee; Globe Automatic Sprinkler Co., \$33,000; E. J. Lavino & Co., \$100,000; employees of the United Gas Improvement Co., \$100,000; Keystone Leather Co., \$100,000; Louis Walther Mfg. Co., \$50,000; and Baldwin Locomotive Works, \$300,000.

The quota for subscriptions to the fourth Liberty loan at the plant of the Merchants Shipbuilding Co., Harriman, near Bristol, Pa., has been set at \$1,000,000, and at the Liberty loan rally held at the plant on Oct. 1 more than 8000 workers pledged their efforts to the campaign. A similar quota of \$1,000,000 has been arranged for the plant of the New York Shipbuilding Co., Camden, N. J. with its 12,000 employees, while at the neighboring shipyards of Pusey & Jones, Gloucester City, it is expected to double the subscriptions of the third Liberty loan, which aggregated \$350,000.

In less than one hour after the campaign for the fourth Liberty loan was inaugurated at the plant of the Pittsburgh Filter Mfg. Co., Oil City, Pa., the 227 employees subscribed 100 per cent for the issue; every employee purchased a bond. The machinists' organization at Allentown, Pa., has subscribed a total of \$20,000 to the loan. Employees of the Pennsylvania Railroad at Harrisburg and surrounding districts have subscribed \$124,050 to the loan issue.

A few hours after the opening of the fourth Liberty loan drive at Reading, Pa., the plant of T. A. Willson & Co., Inc., manufacturers of goggles and glasses, had 225 per cent of its quota subscribed.

#### Crouch Company Amalgamated with Rownson, Drew & Clydesdale

The W. J. Crouch Co., Inc., and Rownson, Drew & Clydesdale, Inc., announce the amalgamation of their respective organizations. All trading and manufacturing operations henceforth will be conducted under the name of Rownson, Drew & Clydesdale, Inc., with general offices at 68 William Street, New York. P. G. Donald, president Rownson, Drew & Clydesdale, Inc., will continue in this office, while I. Smullyan, president W. J. Crouch Co., will act as managing director of the new firm. Victor E. Karminski and A. E. Hearne, treasurer and general manager of the Crouch company, and Rownson, Drew & Clydesdale, respectively, will in future act as joint general managers of the new concern, Mr. Karminski conducting the Crouch steel division, and Mr. Hearne directing all other trading operations.

Mr. Donald is located at London, England, where Rownson, Drew & Clydesdale was established nearly a hundred years ago. Mr. Smullyan is soon to open an office at San Francisco, and other plans are under way looking to strengthening the company's contacts abroad and with the iron and steel trade in this country.

Plans have been made for the further development and expansion of the Rownson, Drew & Clydesdale engineering division in order to cope with the demand for their gravity runways, portable elevator conveyors and other labor saving devices. These plans will be carried out under the personal direction of John J. Smart, secretary and assistant general manager of the Crouch company.

An advertising campaign that will be carried into all foreign countries, as well as in the United States, will be undertaken by the new firm, embracing both Crouch steel products and Rownson, Drew & Clydesdale specialties. It will be directed by M. Oppenshaw, who has hitherto had charge of the advertising for the Crouch company. H. Lad Landau, assistant secretary and general manager of sales of the Crouch company, will continue with the new concern. So will other leading officers of the company, such as John H. Allen, purchasing agent, who will in the future be assisted by M. Greenberg of Rownson, Drew & Clydesdale; Albert Smullyan, comptroller; O. W. Andrews, traffic manager and head of the company's licensing bureau, and others occupying positions of trust with the old companies.

## PIG-IRON COSTS

### Many Furnaces Shown to Be Producing Above Recent Government Prices

The recent investigation of the Committee of the Associated Manufacturers of Merchant Pig Iron, which submitted its report to the War Industries Board, developed the fact that a large tonnage of pig iron was produced in July, 1918, at a cost materially greater than the maximum Government selling price and that at a number of furnaces, costs had exceeded selling prices for some months prior to July.

In the Tennessee district, furnaces producing foundry iron at the rate of 280,384 tons per annum showed an average cost of \$33.78 per ton. Two showed costs exceeding \$38 per ton. Tennessee furnaces making high silicon iron with an annual capacity of 67,068 tons showed an average per ton cost in July of \$42.30 with an average selling price of \$39.86. Furnace operators stated to the committee that they had labor increases in August and that other increased costs were in sight.

In the Virginia district, it was found that all the furnaces making foundry iron, producing in July at the rate of about 463,000 tons per annum, had an average cost per ton of \$33.05, exclusive of bond and all other interest charges. Some of the furnaces submitting statements for the month of August showed an increase of about \$1 per ton over July.

In the Eastern district, reports from 13 furnaces for July showed an average per ton cost of \$30.74. The committee was convinced that after July, material increases in cost had been made in that district. Of a total of 782,000 tons annual capacity furnaces of 120,948 tons were producing in July at a cost in excess of the Government base price, this tonnage being 15.5 per cent of the total capacity of the district.

In the Central district, detailed statements for July of 24 furnaces, all with coke and ore figured at Government prices and with an annual production of 3,495,000 tons, had an average cost of \$28.83. Of the annual capacity, 19 per cent had a cost above the Government price of \$33 per ton.

The committee found that there were operating in July, at a cost greater than the Government prices, furnaces of annual capacity as follows:

|                          | Tons      |
|--------------------------|-----------|
| In Alabama .....         | 300,000   |
| In Tennessee .....       | 347,452   |
| In Virginia .....        | 463,000   |
| In eastern district..... | 120,948   |
| In central district..... | 668,000   |
| Total .....              | 1,899,400 |

The committee believed this statement indicated the menace of decreasing production was imminent.

Referring to the statistics of production of merchant pig iron reported by the American Iron and Steel Institute, the committee said that if the production continued at the decreased rate of the first half of the year, the reduction in output for 1918 would amount to 1,530,958 tons, compared with 1917.

Believing that it was the first duty of the committee to use its best endeavor to keep in operation every stack producing pig iron and to obtain maximum production and being of the opinion that to accomplish this, advances in base prices were necessary and in view of the fact that practically all merchant pig iron is allocated, the committee recommended that the base price for both No. 2 foundry and basic iron be increased to \$38 per ton f.o.b. furnace. The committee added, however, that if the War Industries Board deemed it advisable to depart from the policy of uniform prices for pig iron at all producing points, the committee would submit a schedule of prices for the different producing districts or sections.

The Pittsburgh & West Virginia Railroad, Pittsburgh, has broken ground for erection of an engine house and shops at Rook, Pa., to cost \$250,000.

## NEW EXPORT PROCEDURE

### War Trade Board to Issue Licenses Carrying Ordinarily a C Priority

WASHINGTON, Oct. 8.—The War Industries Board and the War Trade Board have agreed upon a new procedure of the highest importance to the export business in iron and steel, under which C priority ratings will automatically be accorded commodities for which the export licenses are issued. This ruling will greatly simplify matters involved in questions arising over these exports. It also reverses the previous procedure by cancelling the previous ruling of the War Industries Board which forbade the filing of an application for export until a priority ruling had been secured.

The joint announcement of the War Industries Board and the War Trade Board provides that:

"On and after Oct. 14 applications for licenses to export any article on Schedule XP, annexed hereto, should be filed with the War Trade Board," and must include a new supplemental information sheet, form X-26, which will be ready for distribution by the War Trade Board on and after Oct. 14.

The priorities committee of the War Industries Board has awarded priority classification C to all articles (on which priorities are issued) which are on the export conservation list of the War Trade Board and are covered by export licenses issued on and after Oct. 16. No class C certificates will be issued with such licenses. If the article specified on the licenses is one on which priorities are issued, and if no individual priority certificate accompanies the export license, the license itself will be evidence that the articles covered by it have been automatically awarded priority classification C. No such export licenses will be accompanied by individual priority certificates of the priorities committee when in the opinion of the priorities committee a higher rating than class C is warranted. These priority certificates will be issued by the priorities committee and forwarded with the export license without further request from the applicant.

Export licenses issued on and after Oct. 16 for the exportation of iron or steel, or the products or manufactures thereof, which are not covered by priority classification, will in themselves constitute a permit and approval from the Director of Steel Supply for the filling of the orders for the quantity of iron or steel specified in such export license to the extent that such delivery will not interfere with the delivery when and as required of orders covered by priority.

It is the policy of the War Industries Board and the War Trade Board to discourage and prevent exporters and manufacturers from purchasing, manufacturing, or producing articles on the export conservation list for the fulfillment of specific export orders until an appropriate export license has been issued. Instances have come to the attention of the War Trade Board in which manufacturers before obtaining export licenses have manufactured articles for specific export orders which articles while useless for domestic consumption could not under the regulations of the War Trade Board be exported. It is essential for the proper conservation of commodities in the United States that this practice be stopped, and it is the purpose of the War Trade Board to refuse licenses to exporters who do not conform to this policy.

Priority is being administered generally on iron and steel products, copper and brass products, electrical equipment and the products of which any of the above form an integral part. Priority is not being administered at this time on lumber or lumber products, paper or paper products, chemicals, brick, cement, lime, hides, pig tin, tin plate, mine products and numerous other items which cannot well be enumerated. It is not possible to prepare lists in detail covering either priorities or non-prioritized products and even in those mentioned above exceptions will from time to time occur. Any inquiries with respect to the commodities upon which priority is being administered should be addressed to the priorities committee of the War Industries Board.

The following is the "schedule XP" referred to in the announcement:

Pig iron, ferrosilicon, spiegeleisen, scrap, ingots, billets, blooms, slabs, sheet bars, skelp, wire rods, alloy steel, high speed steel, tool steel, bars, hoops and bands (including hot and cold rolled strip steel), shapes, fabricated structural steel, plates (this includes No. 11 U. S. gage but not 11 B. W. gage), sheets, boiler tubes, mechanical tubes, boring tubes, oil well casing, line pipe, drive pipe, cast-iron pipe, wrought iron and steel pipe, poles, wire rope, cable and strand consisting of six wires or more, rails and splice bars, frogs and switches, railroad tie plates, railroad track spikes, railroad track bolts, boat spikes, wire, wire nails, wire spikes, cut nails.

Under a previous ruling of the War Trade Board permits were to be issued for the importation of a total of 125,000 tons of pyrites from Spain between Jan. 1 and Oct. 1, 1918. Of this amount 56,400 tons have not been imported, and the time for the issuance of licenses for this balance has been extended to Jan. 1, 1919. The War Trade Board also added drill chucks to the export conservation list, effective Oct. 10.

W. L. C.

### Cleveland Section of Mechanical Engineers Established

The American Society of Mechanical Engineers has established a section in Cleveland known as the Mechanical Section of the Cleveland Engineering Society. The petition for this section was made jointly by members of the local society and by members of the national society resident in Cleveland. This new section comprises the towns or cities of Akron, Barberton, Bedford, Chardon, Cleveland, Cuyahoga Falls, East Cleveland, Elyria, Hudson, Kent, Lakewood, Lorain, Massillon, Quarryville, Ravenna, Sandusky, South Euclid, Wickliffe, Willoughby and Wooster, totalling a society membership of approximately 260 at the present time, the sixth largest in the country.

The Cleveland Engineering Society was organized in 1891 and now comprises a membership of approximately 1200, and is known throughout the country as one of the most active and influential local organizations of engineers. The national societies of civil engineers, electrical engineers and automotive engineers all have organized groups in Cleveland, so that opportunities for co-operation and co-ordination of activities are manifold.

Many of the officers and prominent members of the Cleveland Engineering Society are also included in the new section; notably R. I. Clegg, who this week leaves Cleveland to become New England editor of THE IRON AGE; Prof. F. H. Vose, Col. E. H. Whitlock, F. L. Sessions, F. W. Ballard, A. H. Bates, H. C. Hale, A. G. McKee, and J. H. Stratton. In addition to the liaison members, there are C. E. Drayer, George S. Black, and W. O. Henderer of the Cleveland Society; and Ambrose Swasey, Worcester R. Warner, S. T. Wellman, past officers of the society; G. E. Merryweather, and R. H. Danforth.

### Shipment of Iron and Steel by Express

The American Railway Express Co. recently issued an order that all shipments by express of bar steel, bar iron or rods must be boxed and marked. It was soon found that it would be impracticable, if not impossible, to box all such consignments. The matter was taken up with D. S. Elliott, vice-president of the American Railway Express Co., New York and an agreement reached that the rule requiring boxing would be immediately withdrawn and new rules supplementing the present marking rules would be issued. The new rules provide that bars or pieces less than 1 in. round, square, flat or cross-section, when shipped singly, are to be securely wired, but the boxing requirement has been eliminated. Full details can be obtained from the Sub-Committee on Traffic Conditions of the American Iron and Steel Institute, 71 Broadway, New York, of which A. G. Young is chairman.



## HEAVY PIG IRON DEMAND

## Government Policy Outlined in Conference with Cast-Iron Pipe Manufacturers

A delegation of representatives of the cast-iron pipe manufacturers of the country spent several days in Washington last week conferring with officials of the Finished Material section of the War Industries Board, of the Ordnance Department, the United States Shipping Board and other departments of the Government in regard to the supplying of pipe for the Government and the obtaining of pig iron for use in the cast-iron shops. The attitude of the Government as revealed by the statements of various officials indicated very plainly that there is to be no decrease in production of ships, munitions or anything necessary for the prosecution of the war.

An official of the finished materials section of the War Industries Board stated that it would probably be necessary to operate all the furnaces in eastern Pennsylvania on basic pig iron after Jan. 1 and that there would be no iron for the use of cast-iron pipe manufacturers. He expressed the opinion that these manufacturers could use as high as 85 per cent of scrap as a substitute for pig iron. The manufacturers in reply urged the importance of supplying cast-iron pipe for housing projects, cantonments and other needs of the Government and stated that it would not be possible to use scrap to the extent mentioned or even to obtain it, if it could be used.

It was suggested by one Government official that it might be wise to increase the production of cast-iron pipe in the South in order to put all furnaces in Eastern territory on steel making iron. In reply to this suggestion, a prominent cast-iron pipe manufacturer of Birmingham stated that on account of the labor shortage it would be impossible to increase the production of cast-iron pipe in the South.

Representatives of the United States Shipping Board asserted that increased amounts of steel would be necessary to meet the demands of the shipyards for plates and shapes and a representative of the Ordnance Department was equally emphatic in saying the demands of his department would be greater than ever.

After numerous conferences, it was decided to appoint a committee of cast-iron pipe manufacturers to co-operate with the War Industries Board in an effort to continue the manufacture of pipe on at least a limited basis and at the same time meet the demands in many other directions for pig iron. The committee consists of L. R. Lemoine, president United States Cast Iron Pipe & Foundry Co., Philadelphia, chairman; A. M. Campbell, president Glen Morgan Pipe & Foundry Co., Lynchburg, Va.; W. E. Clow, president J. B. Clow & Bro., Chicago; E. E. Linthicum, president National Cast Iron Pipe Co., Birmingham, Ala., and W. H. Hulick, president Warren Foundry & Machine Co., 11 Broadway, New York.

The Ohio Metal Briquetting Co., Cleveland, has been organized with a capital stock of \$300,000 and will manufacture briquettes from steel, cast iron, brass, copper and aluminum borings and turnings. An experimental plant is now in operation, but the erection of a new plant will be started shortly with a capacity of about 5000 tons per month. Scrap will be hydraulically compressed into cylindrical briquettes, mostly 6 in. in diameter and 4 to 6 in. in height. The officers of the company are R. M. Atwater, New York, president; A. A. Murfey, vice-president; Felix Vogel, vice-president; Max Loewenthal, New York treasurer; W. H. Dickey, assistant treasurer, and H. H. Hauxhorst, secretary. The offices are located at 905-909 Schofield Building, Cleveland.

## THE MILWAUKEE MEETINGS

## Notable Resolution Passed by the Joint Assemblage of Foundry Interests

MILWAUKEE, Oct. 8.—"Resolved by the American Foundrymen's Association, the Institute of Metals Division of the American Institute of Mining Engineers, the Iron and Steel Section of the American Institute of Mining Engineers, the American Malleable Castings Association and the foundry equipment manufacturers of the United States in joint meeting assembled:

"That every resource of these allied metal trades is again pledged to the Government, not only in the production of materials for the conduct of the war, but for the accelerated manufacture of these materials to enable the Government to intensify greatly its prosecution of the war and to bring about a speedy and crushing defeat of the enemy that will lead to his abject and unconditional surrender."

By a standing and unanimous vote the foregoing resolution was adopted to-day at the joint meeting of the bodies named at which their respective conventions were inaugurated in Milwaukee. The passage of the resolution followed the reading by Secretary-Treasurer A. O. Backert of a stirring letter received from Capt. R. A. Bull, former president of the American Foundrymen's Association, now captain, ordnance department, with the expeditionary forces.

The opening joint meeting was called to order by B. D. Fuller, president of the foundrymen's association, who introduced Wisconsin's governor, Emanuel L. Philipp, who welcomed the visitors to Milwaukee and the State of Wisconsin. In an eloquent speech Governor Philipp praised what the foundry trades had done for the nation at this time of stress, incidentally saying that in visits to shops in Milwaukee some might be found who would answer in foreign tongues yet who are Americans just the same. While some economic changes will inevitably follow the war, the Governor said in his opinion business would not stagnate, in view of the rebuilding and upbuilding which will be found necessary here and abroad. He predicted that cheaper transportation will be a demand of the people and particularly the farm.

The war was the uppermost topic at the opening session, as it will be at those to follow. It was announced that a special session on semi-steel gas and smoke shells will be held Thursday afternoon, when there will be presented a comprehensive report prepared by the committee advisory to the Ordnance Department at Washington. Something on the French procedure will be given by members of the French technical commission.

President Fuller in his report referred to Milwaukee as the sixth foundry center in the country. The resolution pledging the foundry resources of the country to the Government was offered by V. E. Minich, vice-president Sand Mixing Machine Co., New York. C. S. Koch, president Fort Pitt Steel Casting Co., McKeesport, Pa., now of the cannon section, production division, Ordnance Department, told of the magnitude of the task of his department. A message was read from E. N. Hurley urging widespread support of foreign trade to come and the merchant marine now being created. With moving pictures, Major F. B. Gilbreth described modern methods of transferring engineering skill by the aid of the movie.

The attendance is large.

C. L.

## More Cars for France

In line with the statement in THE IRON AGE of June 20 that many thousands of cars were urgently demanded for use in France by the American Expeditionary Forces and following the recent award of 20,000 such cars, is the request for prices now before the car builders of the country for a total of 40,315 cars. These are classified as follows: 4060 flat cars, 9670 low-side gondolas, 7135 high-side gondolas, 7840 gondolas with cabs, 10,010 box cars, 550 refrigerator cars and 1050 tank cars.

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## The Eight-Hour Wage Basis

The working out of a plan for the application of the eight-hour measuring rule to the iron and steel works day is proving no easy task. Two features of the Steel Corporation's program have been announced—first, that for work on Sundays and holidays the usual rate will prevail except on hours over eight, for which time and one-half will be paid; second, that overtime payment will apply to tonnage men and piece workers the same as to workers by the day.

It is unfortunate that such a considerable part of the daily press so far fails to understand what "the eight-hour basic day" means in the steel industry as to cause it to infer that its recent adoption is a step toward, if not an actual adoption of, an eight-hour work day, or in other words the establishment of a three-shift system in cases where two shifts have hitherto been the rule. Such a change would of course be suicidal and would greatly decrease the output of pig iron and steel, for the 50 per cent increase in the number of men required for the jobs could not be secured. Instead of the adoption of this system of payment being a step in that direction, it is a measure of protection against such a trend. It puts a premium upon the hours it is vital the men should work in order to maintain production.

The system has one menace to the wartime program—that it may encourage men to "lay off" more frequently, for the 50 per cent bonus is for the last four or the last two hours the man works on any given day. Perhaps measures can be taken against men absenting themselves more frequently than hitherto. The fact should be recognized at large, however, as it is in the steel industry, that the average steel mill worker, given a certain hourly rate of pay, prefers to work the long hours. Some years ago, as seven-day labor was being eliminated, it was found that many men sought outside employment for the day that was cut out of their regular job.

A six-hour shift for factories after the war, with continuous employment of machinery, has been proposed in Great Britain, though the proposal has fallen very far short of receiving endorsement, or even very patient consideration. It is obvious, however, that at some time in the future the three-shift system for American blast furnaces

and steel works will prove preferable. It makes better citizens. The supply of men anxious or even willing to work 12 hours has undergone a sharp decrease through the stoppage of immigration.

## Rates of Ship Construction

Reference was made in this department under date of Sept. 12 to the fact that the quantity of plates for shipbuilding furnished by the mills up to date greatly exceeded the tonnage represented by actual launchings of steel hulls so that, apparently, there was a large accumulation of plates awaiting consumption. It was suggested, however, that the rate at which hulls had been launched in the past was no safe criterion for the future.

A comprehensive summary of the status of American shipbuilding recently compiled under authority of the Shipping Board prompts fresh consideration of this subject. Precise information is given as to the number of shipways in the country when the Shipping Board as now constituted began its work in August, 1917, and the number of ways completed and not completed on Sept. 1, 1918. The tremendous increase that has occurred indicates quite clearly that there has not been time for many of the yards to reach even an approximation of efficient operation.

In August, 1917, there were 162 ways for steel ships and 73 ways for wood ships, a total of 235 ways, and about three quarters of the capacity had been pre-empted by the naval construction program. On Sept. 1, 1918, the condition was as follows:

Number of Shipways in United States

|                                    | Completed | Building or Projected | Total |
|------------------------------------|-----------|-----------------------|-------|
| Under Fleet Corporation:           |           |                       |       |
| For steel ships .....              | 410       | 63                    | 473   |
| For wood, composite and concrete.. | 400       | 54                    | 454   |
| Total Fleet Corporation .....      | 810       | 117                   | 927   |
| Not under Fleet Corporation.....   |           |                       | 93    |
| Grand total.....                   |           |                       | 1,020 |

The ways not controlled by the Fleet Corporation are, in the main, unimportant, being chiefly for small boats. Of the 410 ways for steel ships

that are counted as completed, some have just been completed, others are technically completed but far from being in full working order, and perhaps none of the yards is working altogether as well as it will eventually be able to work.

As to capacity of shipways, there are limitations both within and without. Of limitations within, there are variations in equipment, also in labor supply and in the spirit in which the men work. It is possible that the cancellation, announced some time ago, of all "cost plus" contracts has had the effect of eliminating such "slacking" as occurred on the part of men under instructions from foremen, but there is gossip in circulation that is certainly very disagreeable. As to voluntary slacking on the part of the men, that has not been entirely eliminated, if indeed the sum total has been reduced. When the trouble is righted at one yard it may break out in another.

The seven best records of launching time for steel hulls show intervals ranging from 16 days to 46 days. The Crawl Keys, 3500 tons deadweight, was launched by the Great Lakes Engineering Works in 16 days after the keel was laid. Three hulls, including the 12,000-ton Defiance of the Alameda yard of the Bethlehem company, were launched in 46 days. Taking size of hull into consideration, the best performance was the Invincible, also at Alameda, no less than 12,000 tons deadweight, launched in 31 days. All the records mentioned are in calendar and not working days.

If 410 shipways should each launch a hull every month, in the proportions of two 5500-ton hulls to one 7500-ton hull, and one 12,000-ton hull, there would be launchings at the rate of 2,562,500 tons deadweight per month, not to mention composite, concrete and wood ships.

The average launchings in the past four or five months have been about 400,000 tons deadweight a month, all classes of vessels. For steel hulls at the rate of 2,562,500 tons per month, about 10,000,000 net tons of steel plates a year would be required. Thus the plate requirements may easily mount above the recent allotment of 50,000 tons a week.

### Education to Reduce Accidents

A great metal-working plant has proved conclusively that systematic education of workers as to the hazards of their employment is a prime factor in reducing the percentage of accidents. The tests cover a period of more than three years and have been made under conditions ideal for securing comparisons. Because of the nature of the industry the accident risk is normally large. Of the employees many have little knowledge of English, and many are bound by superstition and tradition, which are not easy to overcome.

Before the educational system went into effect the plant had been carefully and scientifically studied with the purpose of providing safeguards against accident, and the results had been embodied in many mechanical and visual means of reducing danger. This effort was long continued. Rigid rules had been laid down, with severe penal-

ties for violations. A hospital system had been in operation for some time, with a works surgeon in charge. Compulsory physical examination of workmen had been established.

The result was a steady decrease in the number of accidents, the curve showing 13 to each 100 employees for the early part of the three-year period, and less than one to each 100 for the third year. The figures are the more impressive, since the period covered has been one of intensive production, with large additions to the number of men employed and much night work, creating a condition of tension under which the hazard would be increased.

Measured in economic gain the results are exceedingly important. The element of saving include a decrease in idle hours, figures of which, while known to be large, are not obtainable because they cannot be separated from those representing other influences. Another direct result is a slower turnover of labor, or in other words, a longer average service of trained workers. Frequent accidents are demoralizing. They give a plant a bad name, while the absence of accidents establishes a reputation which is still another factor in low labor turnover and in excellence of product.

It would be unfair to give entire credit for this improvement to the educational system. Other elements enter into it, most important of which are further improvements in safety devices and a more complete operation of compulsory physical examination of workmen. But these influences, while important, are held to have a minor place as compared to education.

A great many manufacturers have a false conception of what constitutes their accident hazards. Statistics gathered by the various states in connection with workmen's compensation prove that only one-fifth of industrial accidents are caused by machinery. Few realize that the greatest of all causes is falls. There are also other groups of hazards, such as that of slivers, projecting nails and the like, of which works can be rid, and all of them possible sources of serious consequences, unless education has established in workers' minds the need of prompt and skillful medical treatment for even the most trifling hurt.

Further, workmen's compensation statistics agree in a very high rate of accidents in the first weeks of employment, particularly the first week or ten days. In the works under discussion an applicant after his physical examination, is made to study a polyglot placard which warns him, in the language with which he is most familiar, of the elemental dangers that confront him. At the employment bureau he is again given rules of instruction concerning shop hazards, and the foreman to whom he is assigned repeats the lesson and so does the instructor who initiates him into the details of his labor, at the same time teaching the exact manner of doing the work with the minimum of risk to himself. The man is watched and if he needs warning it is administered forcefully, until finally he comprehends fully the conditions which attend his employment. The result is that accidents in the early weeks of employment



are very few indeed, less, in fact, than in later periods.

The really great factor of danger, greater even than that of ignorance, is carelessness, heedlessness, shiftlessness, either on the part of the victim or of some other person. It is here that teaching reaches the maximum of persistency. It is because of these essentially human traits that safety devices sometimes fail to protect, and warning notices fail to warn, after the novelty of their presence has worn off.

Everyone in the works is reached by the educational system, in the form of individual teaching, heart to heart conferences in department groups, lectures, including the powerfully impelling suggestion of motion pictures. The campaign is one of unrelenting activity, and to this doubtless its great success is largely attributable.

In considering what has been obtained by any organized system on the scale possible in large works, owners of smaller establishments are apt to dismiss the idea as something which they cannot apply successfully in their own organizations, because of the financial outlay involved. Superintendents and foremen can be induced to study this side of the conduct of their departments and enlist the co-operation of workers in the carrying out of the plan. Shop lectures by a surgeon and others, striking at occupational hazards from various angles, will supplement individual instruction. No matter how large or how small a plant may be, the elimination of accidents due to ignorance and carelessness pays large returns on the effort.

### Bonds and Public Improvements

Before the war the common opinion was that because of the enormous expense of modern warfare no great war could be financed for any length of time, say for a period of two or three years. Perhaps the reasoning was sound, on the premise that the financing would have to be done by private treaty between governments and bankers; but that is not the manner of modern war loans at all. It is not a case of arranging a loan on terms that will be attractive to the bankers. The modern war loan is carried to the people, which in itself is a very long step. Its success does not hinge upon the position the people find themselves in, as to ability or desire to subscribe. If they do not chance to have money to subscribe, they are required to get the money by denying themselves. If they are not already disposed to subscribe, they are influenced to become desirous of subscribing. In the United States, it is the first time the people as a whole have become bond buyers. Through the adoption of this principle the ability of the Government to float bonds has been multiplied many times.

Obviously something very important has been learned as to the floating of bonds, and the people have acquired certain habits. It is not necessary that all this should be stopped and forgotten after the war. There has been much speculation as to what will govern financial and industrial conditions then, and particularly as to the amount of capital that will be available for reconstruction

work and for improvements. Of the sum total of industrial activity in the country, municipal improvements constitute a very considerable part. Nothing is clearer than that practically all the now familiar processes of floating a Liberty loan can be employed after the war, in floating a municipal loan for improvements. One of the appeals of the Liberty loan is that of making the world a decent place to live in. Precisely the same appeal can be made, to its citizens, on the part of a city or borough. Hitherto the common practice has been to deal with the bankers, and the terms offered often decided whether or not the contemplated improvement would be made. Now the municipality will find itself with a vastly wider field. The actual machinery itself for floating a loan direct with its population will be largely available. It will be strange indeed if the idea does not take hold with many cities and boroughs after the war. Such loans can be floated without disturbing the money market. An incidental but very important feature, as municipal affairs go, is that the direct interest of the people thus commanded will insure much more wisdom and honesty in planning and carrying out the improvement than normally obtains in such matters.

The close examination of the country's material resources that the war has caused has brought out both the great extent of its wealth in material things and the magnitude of the annual income of the people. It has brought out another thing—the very high ratio of income to wealth. In our long development we have saved very little. The existing wealth represents the income of but a very few years. If the people economize they can save much more. A larger proportion of each year's income can be turned into things of permanent value. The municipality affords a good channel for such activity. There is danger of inflation and extravagance after a war, because men are sanguine and eager to do things. Municipal improvements, where the authorities are answerable to the population which furnishes the money directly, present less danger than many other activities, and since they have been held in check by the war, are likely to be very extensive when peace comes.

### Great Waste in the Use of Fuel Oil

WASHINGTON, Oct. 6.—An investigation recently conducted by the Bureau of Mines in co-operation with the Fuel Administration has furnished data for the statement now made by the bureau that fuel sufficient to operate the railroads of the country for one month is being wasted every year by the users of fuel oil. Stated in another way, the waste in the use of fuel oil is five times the fuel necessary for all the Federal Government consumption, including that of the Navy and Army. It is stated that last year's consumption amounted to 160,000,000 barrels of fuel oil and that 40,000,000 barrels, or one-fourth of the entire amount, was wasted. At \$3.50 per barrel this represents \$140,000,000. As one result of the investigation a handbook for boiler plant and locomotive engineers in the efficient use of oil as fuel has been issued by the Bureau of Mines, giving instructions to all operators of oil-burning plants.

The American Steel Export Co. has opened branch offices in Seattle, Wash. Matthew R. Rosse, will have charge of sales in the Far East, and H. B. Brown of shipments.

## Announcement Covering Barbed Wire and Warehouse Extras

The following statement has been issued by E. H. Gary, chairman, Committee on Steel and Steel Products of the American-Iron and Steel Institute:

"Referring to my statement under date of Sept. 26, 1918, it appears that the recommendation in respect of barbed wire was incomplete and the following correction should be made. Cancel the line reading:

Add for special weights or packing..... 15 in.

and substitute therefor the following:

### Extras for Packing

|                             |        |
|-----------------------------|--------|
| For spools 75 lb. to 95 lb. | \$0.15 |
| For spools 60 lb. to 75 lb. | 0.20   |
| For spools 50 lb. to 60 lb. | 0.25   |
| For spools 40 lb. to 50 lb. | 0.40   |
| For spools under 40 lb.     | 0.65   |

### Warehouse Trade

"Add to the announcement of Sept. 26, 1918, the following:

"Note: Where materials are customarily shipped in standard containers of substantially uniform type, such as kegs, barrels, boxes, etc., the freight to be added to the carload mill price, f.o.b. Pittsburgh, may include the freight on the average weight of the container as determined by custom and experience.

"THE TABLE SHOWING MAXIMUM SELLING PRICES FROM WAREHOUSE STOCK AT VARIOUS IMPORTANT POINTS IS INTENDED MERELY TO ILLUSTRATE THE PRINCIPLES ON WHICH THE RE-SALE PRICES WOULD BE CALCULATED. DISTRIBUTORS SHOULD FIGURE THEIR RE-SALE PRICES FROM THE SPECIFIC INSTRUCTIONS GIVEN IN REGARD TO EACH ITEM, AND DISREGARD THE TABLE, IF IT SEEMS TO CONFLICT."

## Southern Ohio Pig Iron Association Is Formed

The Southern Ohio Pig Iron Association was organized at Portsmouth, Ohio, Sept. 28. The purpose of the association is to increase the production of pig iron as much as possible through co-operation, so that the Government's needs may be more fully supplied.

R. H. Sweetser, of the American Rolling Mill Co., Columbus, was chosen president, and in his opening address he said: "It is the operating end just now in which we, as well as the Government, are vitally interested. We want 100 per cent efficiency in our plants and we will get it."

Other officers are as follows: Vice-presidents, S. G. Gillilan, C. R. Peebles, W. R. Knapp, S. E. Stephenson and R. S. Brunner. P. R. Briscoe was chosen as secretary and treasurer.

Those present at the banquet and meeting were W. R. Knapp, H. E. Cook, T. Whiting, C. H. Heist, Peter Willander, J. G. Harding, N. G. Spangler, R. S. Brunner, Emmett McKeown, Col. H. A. Marting, E. O. Marting, Charles Rice, Karl Steinbacker, Charles and Coles Peebles, Homer N. Bliss, S. G. Richardson, William Jeffrey and R. H. Sweetser.

## Revenue Bill Moves Slowly

WASHINGTON, Oct. 8.—Efforts of Secretary of the Treasury McAdoo to speed the action of the Senate Finance Committee on the \$8,000,000,000 war revenue bill have had little result. The committee is still holding daily sessions. Whenever it comes to purely routine features of the bill, the committee takes a spurt and approves a series of sections.

But it has been careful so far not to pass judgment upon disputed sections. All of these are being laid aside for later consideration. As a result, the progress of the committee gives little indication that an early report is to be expected. Chairman Simmons still thinks it may be possible to have a report by Oct. 25, but few of the members of the committee are inclined to agree with him. In fact, it is still doubtful whether it will be possible to get a committee report on the measure before Election Day.

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## "The Iron Age" and Its Readers

The official blast-furnace-production figures for the months of January to July inclusive, now available, are published in this issue. A comparison of the figures collected and published at the close of each month by THE IRON AGE shows a difference from the total of the monthly figures of less than 3/10 per cent. The effort involved in safeguarding the accuracy of our monthly statistics may be appreciated when it is stated that the pig-iron figures are often collected within one or two days after the close of the month.

The leading article of this issue will help materially, it is believed, to enlighten the foundry industry in respect to what is involved in making semi-steel projectiles, so called. It is not unlikely that upward of 100 foundries must be mobilized, not to mention machining capacity, and some geographical distribution will be necessary, not alone to get capacity but to meet restrictions of fuel and transportation zones. The various regional war resources and conversion committees of the War Industries Board are likely to guide in the contracting with the Ordnance Department, as is also the War Service Committee of the American Foundrymen's Association considering the subject this week at Milwaukee.

# HIGHEST PIG IRON OUTPUT

Daily Production in September 113,942  
Gross Tons

Ferroalloy Total of 66,275 Tons 21 Per Cent Over  
Former Record of Last May—365  
Furnaces in Blast

A new high record of 113,942 gross tons daily was produced by blast furnaces in September, exceeding the former high mark of pig-iron production—113,189 tons in October, 1916—by 753 tons, and the August output of 109,341 gross tons by 4601 tons daily. Ferroalloys produced in September amounted to 66,275 gross tons, creating another record, and surpassing the former of 54,633 tons in May, 1918, by over 21 per cent. For the first nine months of this year, 28,231,415 gross tons of pig iron were made, as compared with 28,794,231 tons in the same period in 1917, and 29,041,045 tons similarly in 1916. Fourteen furnaces were blown out and 7 put in blast, giving 365 active Oct. 1, as compared with 372 Sept. 1. The estimated capacity in blast Oct. 1 is 114,570 gross tons, as against 112,390 tons on Sept. 1.

## Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from September, 1917, is as follows:

### Daily Rate of Pig-Iron Production by Months—Gross Tons

|                      | Steel Works | Merchant | Total   |
|----------------------|-------------|----------|---------|
| September, 1917..... | 73,290      | 31,175   | 104,465 |
| October .....        | 76,664      | 29,886   | 106,550 |
| November .....       | 77,135      | 29,724   | 106,859 |
| December .....       | 66,605      | 26,392   | 92,997  |
| January, 1918.....   | 55,662      | 22,137   | 77,799  |
| February .....       | 56,938      | 25,897   | 82,835  |
| March .....          | 74,526      | 29,122   | 103,648 |
| April .....          | 79,199      | 30,408   | 109,607 |
| May .....            | 81,238      | 29,937   | 111,175 |
| June .....           | 81,724      | 29,059   | 110,793 |
| July .....           | 79,248      | 31,106   | 110,354 |
| August .....         | 80,947      | 28,394   | 109,341 |
| September .....      | 83,579      | 30,363   | 113,942 |

## Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in August and the three months preceding:

### Monthly Pig-Iron Production—Gross Tons

|   | June<br>(30 days) | July<br>(31 days) | Aug.<br>(31 days) | Sept.<br>(30 days) |
|---|-------------------|-------------------|-------------------|--------------------|
| New York .....                                  | 222,908           | 229,424           | 219,040           | 222,506            |
| New Jersey .....                                | 26,990            | 25,588            | 17,049            | 19,017             |
| Lehigh Valley .....                             | 99,231            | 112,305           | 114,397           | 133,550            |
| Schuylkill Valley .....                         | 95,572            | 98,197            | 91,296            | 85,873             |
| Lower Susquehanna and<br>Lebanon Valleys .....  | 75,023            | 84,489            | 87,118            | 92,582             |
| Pittsburgh district .....                       | 686,658           | 707,023           | 687,433           | 699,802            |
| Shenango Valley .....                           | 166,036           | 161,548           | 177,204           | 174,063            |
| Western Pennsylvania .....                      | 190,596           | 200,511           | 182,315           | 185,508            |
| Maryland, Virginia and<br>Kentucky .....        | 90,769            | 98,334            | 90,423            | 99,035             |
| Wheeling district .....                         | 133,220           | 138,736           | 140,154           | 136,216            |
| Mahoning Valley .....                           | 296,585           | 293,627           | 292,759           | 310,404            |
| Central and Northern<br>Ohio .....              | 287,264           | 283,402           | 301,665           | 292,521            |
| Southern Ohio .....                             | 68,062            | 64,342            | 69,633            | 68,153             |
| Chicago district .....                          | 536,788           | 577,230           | 556,985           | 529,824            |
| Mich., Minn., Mo., Wis.,<br>Col. and Wash. .... | 114,566           | 113,487           | 112,473           | 124,659            |
| Alabama .....                                   | 203,292           | 201,867           | 221,997           | 215,882            |
| Tennessee and Ga. ....                          | 30,231            | 30,878            | 27,644            | 28,675             |
| Total .....                                     | 3,323,791         | 3,420,988         | 3,389,585         | 3,418,270          |

Among the furnaces blown in were one Wharton in New Jersey, one Josephine in western Pennsylvania, the new 500-ton stack of the Brier Hill Steel Co., Mattie and one Haselton in Mahoning Valley, Hamilton in Ohio, and one Clifton in Alabama.

The furnaces blown out include Oxford in New Jersey, Delaware River and one Worth in Schuylkill Valley, Goshen in Virginia, one Grand Rivers in Kentucky, No. 4 Haselton in Mahoning Valley, one Central and No. 4 National Tube in Ohio, Bessie in Hocking Valley, one Clifton, one Gadsden, No. 2 Ensley, and one Vanderbilt in Alabama.

## Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and

spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

### Production of Steel Companies—Gross Tons

|            | Total production |           |           | Spiegeleisen and ferromanganese |        |        |
|------------|------------------|-----------|-----------|---------------------------------|--------|--------|
|            | 1916             | 1917      | 1918      | 1916                            | 1917   | 1918   |
| Jan. ....  | 2,251,035        | 2,244,203 | 1,756,208 | 24,866                          | 38,792 | 30,696 |
| Feb. ....  | 2,183,845        | 1,829,846 | 1,620,254 | 23,877                          | 32,137 | 26,114 |
| Mar. ....  | 2,365,116        | 2,285,430 | 2,349,419 | 29,388                          | 36,563 | 39,122 |
| Apr. ....  | 2,316,768        | 2,370,937 | 2,411,488 | 31,862                          | 39,595 | 35,511 |
| May .....  | 2,408,890        | 2,404,380 | 2,513,577 | 35,844                          | 37,701 | 54,833 |
| June ..... | 2,295,784        | 2,304,155 | 2,407,166 | 38,597                          | 30,829 | 44,844 |
| July ..... | 2,306,303        | 2,369,630 | 2,456,693 | 31,353                          | 43,884 | 51,762 |
| Aug. ....  | 2,313,122        | 2,214,513 | 2,509,357 | 33,338                          | 39,492 | 54,009 |
| Sept. .... | 2,309,710        | 2,198,705 | 2,507,381 | 29,451                          | 42,235 | 66,275 |
| Oct. ....  | 2,530,806        | 2,376,589 | .....     | 34,566                          | 48,691 | .....  |
| Nov. ....  | 2,404,210        | 2,349,545 | .....     | 44,975                          | 34,688 | .....  |
| Dec. ....  | 2,294,620        | 2,094,659 | .....     | 43,470                          | 29,902 | .....  |

## Capacity in Blast October 1

The following table shows the number of furnaces in blast Oct. 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast Sept. 1. The estimate of existing capacity is based largely on the improvement in operating conditions.

### Coke and Anthracite Furnaces in Blast

| Location of furnaces   | Total number of stacks | Number in blast Oct. 1 | Capacity per day | Number in blast Sept. 1 | Capacity per day |
|------------------------|------------------------|------------------------|------------------|-------------------------|------------------|
| <b>New York:</b>       |                        |                        |                  |                         |                  |
| Buffalo .....          | 21                     | 21                     | 6,722            | 21                      | 7,022            |
| Ferro .....            | 1                      | 1                      | 80               | 1                       | 80               |
| Other N. Y. ....       | 3                      | 3                      | 612              | 3                       | 798              |
| Ferro .....            | 1                      | 1                      | 150              | 1                       | 150              |
| New Jersey .....       | 4                      | 3                      | 567              | 4                       | 793              |
| Ferro .....            | 1                      | 1                      | 45               | 0                       | 0                |
| <b>Pennsylvania:</b>   |                        |                        |                  |                         |                  |
| Lehigh Valley ..       | 18                     | 15                     | 4,267            | 15                      | 3,455            |
| Spiegel .....          | 2                      | 2                      | 185              | 2                       | 196              |
| Schuylkill Val. ..     | 13                     | 9                      | 2,713            | 12                      | 2,946            |
| Spiegel .....          | 2                      | 1                      | 107              | 0                       | 0                |
| <b>Lower Susque-</b>   |                        |                        |                  |                         |                  |
| <b>hanna .....</b>     | <b>8</b>               | <b>7</b>               | <b>1,883</b>     | <b>7</b>                | <b>1,785</b>     |
| Ferro and .....        | .....                  | .....                  | .....            | .....                   | .....            |
| Spiegel .....          | 2                      | 2                      | 96               | 2                       | 50               |
| Lebanon Valley ..      | 6                      | 5                      | 819              | 6                       | 847              |
| Ferro and .....        | .....                  | .....                  | .....            | .....                   | .....            |
| Spiegel .....          | 4                      | 4                      | 288              | 3                       | 196              |
| Pittsburgh Dist. ..    | 52                     | 50                     | 22,486           | 50                      | 22,051           |
| Ferro and .....        | .....                  | .....                  | .....            | .....                   | .....            |
| Spiegel .....          | 5                      | 5                      | 841              | 5                       | 624              |
| Shenango Val. ....     | 19                     | 19                     | 5,805            | 19                      | 5,866            |
| Western Pa. ....       | 25                     | 21                     | 6,324            | 20                      | 5,885            |
| Ferro and .....        | .....                  | .....                  | .....            | .....                   | .....            |
| Spiegel .....          | 3                      | 2                      | 95               | 2                       | 125              |
| Maryland .....         | 4                      | 4                      | 1,217            | 4                       | 1,121            |
| Wheeling Dist. ....    | 14                     | 14                     | 4,541            | 14                      | 4,521            |
| <b>Ohio:</b>           |                        |                        |                  |                         |                  |
| Mahoning Val. ....     | 27                     | 26                     | 10,613           | 24                      | 9,440            |
| Central and .....      | .....                  | .....                  | .....            | .....                   | .....            |
| Northern .....         | 26                     | 24                     | 9,624            | 26                      | 10,027           |
| Southern .....         | 17                     | 15                     | 2,394            | 15                      | 2,246            |
| Illinois and Ind. .... | 40                     | 37                     | 17,857           | 37                      | 17,750           |
| Ferro .....            | 1                      | 1                      | 85               | 1                       | 94               |
| <b>Mich., Wis. and</b> |                        |                        |                  |                         |                  |
| <b>Minn. ....</b>      | <b>13</b>              | <b>10</b>              | <b>2,697</b>     | <b>10</b>               | <b>2,755</b>     |
| Col. Mo. & Wash. ....  | 7                      | 4                      | 1,345            | 4                       | 1,121            |
| Ferro .....            | 1                      | 1                      | 113              | 1                       | 100              |
| <b>The South:</b>      |                        |                        |                  |                         |                  |
| Virginia .....         | 15                     | 9                      | 1,137            | 11                      | 1,285            |
| Ferro and .....        | .....                  | .....                  | .....            | .....                   | .....            |
| Spiegel .....          | 4                      | 4                      | 163              | 4                       | 168              |
| Kentucky .....         | 7                      | 4                      | 686              | 5                       | 641              |
| Alabama .....          | 45                     | 29                     | 7,025            | 32                      | 7,256            |
| Ferro .....            | 1                      | 1                      | 32               | 1                       | 38               |
| Tenn. and Ga. ....     | 16                     | 10                     | 956              | 10                      | 950              |
| Total .....            | 428                    | 365                    | 114,570          | 372                     | 112,390          |

## Diagram of Pig-Iron Production and Prices

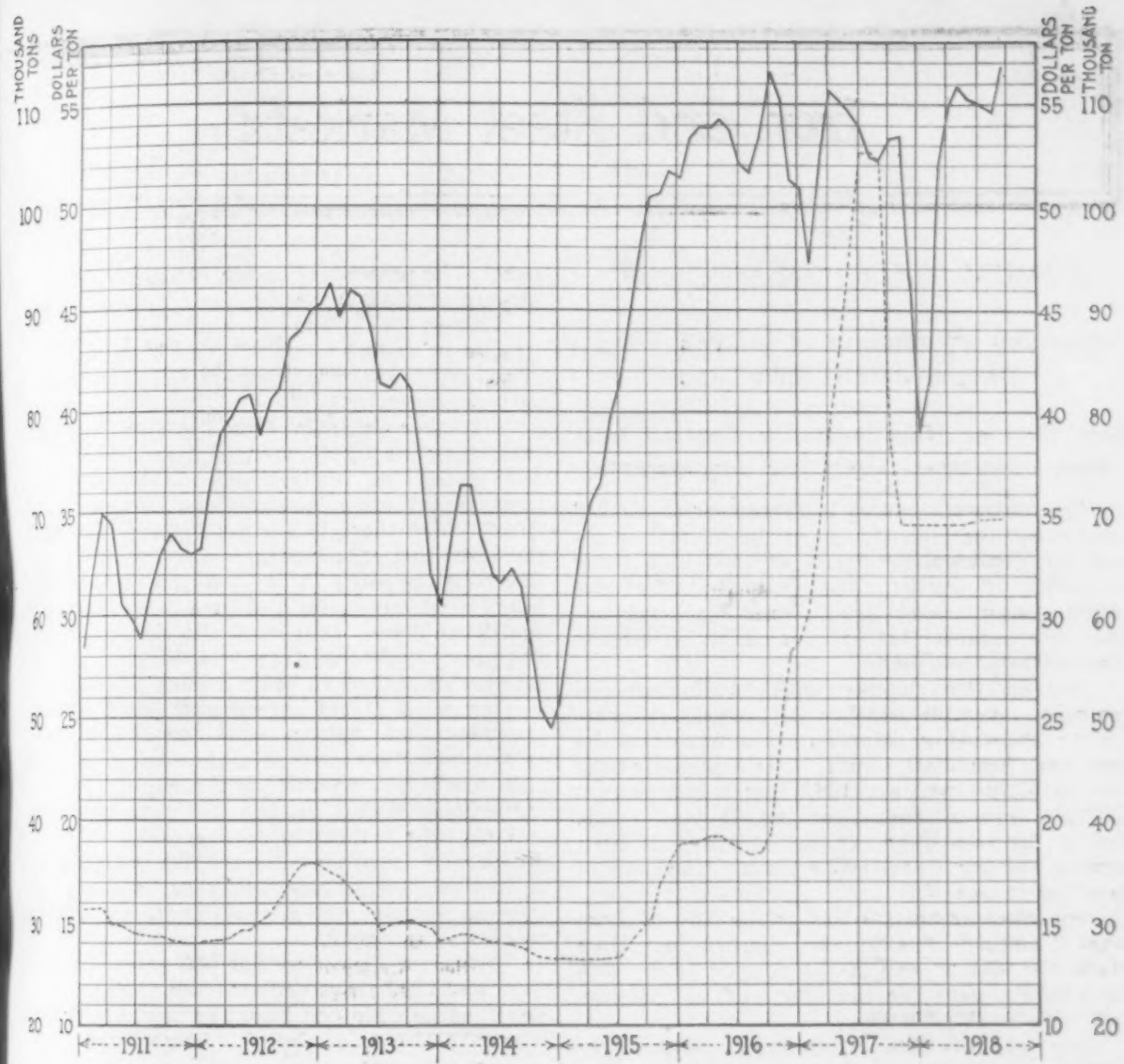
The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago and No. 2X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

### Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1914—Gross Tons

|                | 1914       | 1915       | 1916       | 1917       | 1918       |
|----------------|------------|------------|------------|------------|------------|
| Jan. ...       | 1,885,054  | 1,601,421  | 3,185,121  | 3,150,938  | 2,411,769  |
| Feb. ...       | 1,888,670  | 1,674,771  | 3,087,212  | 2,645,247  | 2,319,299  |
| Mar. ...       | 2,347,867  | 2,063,834  | 3,337,691  | 3,251,352  | 3,213,091  |
| Apr. ...       | 2,269,655  | 2,116,494  | 3,227,768  | 3,334,960  | 3,288,211  |
| May ...        | 2,092,686  | 2,263,470  | 3,361,073  | 3,417,340  | 3,446,412  |
| June ...       | 1,917,783  | 2,380,827  | 3,211,588  | 3,270,055  | 3,323,791  |
| July ...       | 1,957,645  | 2,563,420  | 3,224,513  | 3,342,438  | 3,420,988  |
| Aug. ...       | 1,995,261  | 2,779,647  | 3,203,713  | 3,247,947  | 3,389,585  |
| Sept. ...      | 1,882,577  | 2,852,561  | 3,202,366  | 3,133,954  | 3,418,270  |
| 9 mos. ....    | 18,237,198 | 20,296,445 | 29,041,045 | 28,794,231 | 28,231,415 |
| Oct. ...       | 1,778,186  | 3,125,491  | 3,508,849  | 3,303,038  | .....      |
| Nov. ...       | 1,518,316  | 3,037,308  | 3,311,811  | 3,205,794  | .....      |
| Dec. ...       | 1,515,752  | 3,203,322  | 3,178,651  | 2,892,918  | .....      |
| Total yr. .... | 23,049,752 | 29,662,566 | 39,039,356 | 38,185,981 | .....      |

\*These totals do not include charcoal pig iron. The 1917 production of this iron was 376,525 tons.





The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Cost Per Ton of No. 2 Southern Pig Iron at Cincinnati, local No. 2 iron at Chicago and No. 2X Iron at Philadelphia

The figures for daily average production, beginning with January, 1911, are as follows:

| Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1911—Gross Tons |        |        |        |        |         |         |         |         |
|---|--------|--------|--------|--------|---------|---------|---------|---------|
|   | 1911   | 1912   | 1913   | 1914   | 1915    | 1916    | 1917    | 1918    |
| Jan.  | 56,752 | 66,384 | 90,172 | 60,808 | 51,659  | 102,746 | 101,643 | 77,799  |
| Feb.  | 61,090 | 72,442 | 92,369 | 67,453 | 59,813  | 106,456 | 94,473  | 82,835  |
| Mar.  | 70,036 | 77,591 | 89,147 | 75,738 | 66,575  | 107,667 | 104,882 | 103,648 |
| Apr.  | 68,836 | 79,181 | 91,759 | 75,665 | 70,550  | 107,592 | 111,165 | 109,607 |
| May   | 61,079 | 81,051 | 91,039 | 67,506 | 73,015  | 108,422 | 110,238 | 111,175 |
| June  | 59,585 | 81,358 | 87,619 | 63,916 | 79,361  | 107,053 | 109,002 | 110,793 |
| July  | 57,841 | 77,738 | 82,601 | 63,150 | 82,691  | 104,017 | 107,820 | 110,354 |
| Aug.  | 62,150 | 81,046 | 82,057 | 64,363 | 89,666  | 103,346 | 104,772 | 109,341 |
| Sept.   | 65,903 | 82,128 | 83,531 | 62,753 | 95,085  | 106,745 | 104,465 | 113,942 |
| Oct.  | 67,811 | 86,722 | 82,133 | 57,361 | 100,822 | 113,189 | 106,550 | .....   |
| Nov.  | 66,648 | 87,697 | 74,453 | 50,611 | 101,244 | 110,394 | 106,859 | .....   |
| Dec.  | 65,912 | 89,766 | 63,987 | 48,896 | 103,333 | 102,537 | 92,997  | .....   |

The Le Moyne Steel Co., Park Building, Pittsburgh, has established the following district offices: Metropolitan district, 30 Church Street, New York; district manager, W. F. Furman, for several years connected with the American Locomotive Co. and during the past three years in business for himself in selling tool steel. Detroit district, 66 West Larned Street, Detroit; district manager, A. G. Cappel, formerly representative in the Detroit district for the Braeburn Steel Co. Cleveland district 340 Leader-News Building, Cleveland; representative, William C. Straub, formerly connected with the Swedish Iron & Steel Corporation in the Cleveland district; Alan F. Harden is also connected with the Metropolitan district with headquarters at Hartford Conn. He was previously representative in that territory for the Swedish Iron & Steel Corporation.

Blast Furnace Notes

The Thomas Iron Co., Easton, Pa., has abandoned its No. 10 furnace at Hellertown, Pa. This stack was built in 1868 and rebuilt in 1894, when the dimensions were made 75 x 16 ft.

The Republic Iron & Steel Co. is adding to the blowing and stove capacity of its Haselton furnaces at Youngstown, Ohio, and making other improvements which will increase its annual output of pig iron by more than 100,000 tons.

The Texas Steel Co., Rusk, Tex., has completed the rehabilitation of the Rusk blast furnace, purchased some time ago from the State of Texas, and the plant is now ready for operation. Owing to the shortage of fuel, the date of blowing in has been postponed indefinitely. Between 15,000 and 20,000 tons of ore has been mined and is ready for transportation to the furnace. Limestone is also ready and the quarry is awaiting orders to begin shipment. Coal mining at the company's properties in Alabama is proceeding favorably and it is expected that coke will be delivered from the Alabama ovens in about 60 days.

Low Phosphorus Pig Iron Manufacturers

WASHINGTON, Oct. 8.—At a meeting of the manufacturers of low phosphorus pig iron, with Jay C. McLaughlan, chief of the Pig Iron Section of the Steel Division, War Industries Board, and Charles K. Leith, mineral expert, the ore supply for the coming year was discussed at length. It was declared and generally concurred in that, with certain imports of foreign ores, the requirements of the furnaces would be met.

# Iron and Steel Markets

## A NEW PIG IRON RECORD

September Production at 113,942 Tons a Day, a Gain of 4600 Tons

Steel Shortage More Acute, as Demand from France Increases—Large Car Requirements

Pig iron was produced in September at 113,942 tons a day, the highest rate in the history of the industry, representing a gain of 4600 tons a day over that of August. The concerted effort for greater output yielded fruit sooner than expected, and some improvement in coke quality is already reported here and there.

The fact that October, with its 31 days and generally favorable weather, is always set apart for record-breaking, points to a continuance of the good work begun last month. The September total was 3,418,270 tons, or 113,942 tons a day, against 3,389,585 tons in August, or 109,341 tons a day. Yet 14 furnaces blew out last month and seven blew in, making a net loss of seven. The total in blast Oct. 1 was 365.

September production was at the rate of more than 41,500,000 tons a year, against less than 40,000,000 tons a year as the August rate, while the official figures for the first half of the year were only 18,227,730 tons.

Over against this encouraging response to appeals from Washington and from France, there is this week the first evidence in Pennsylvania steel plants of the inroads of the prevailing influenza. Steel output in eastern Pennsylvania has been cut down and now Pittsburgh reports increasing severity of the disease and fears for mill operations.

However, the Steel Corporation's report for the past week was quite favorable—92.7 per cent of blast furnace capacity and 100 per cent of ingot capacity in operation against 92 per cent and 97.8 per cent respectively in the preceding week.

Ferromanganese and spiegeleisen production went above 66,000 tons last month, or about 12,000 tons more than the best previous record. The manganese situation is easing beyond expectation.

New requirements from France mean the further concentration of mill operations on rails, shell steel, barbed wire and steel for cars. The orders of the Allies have materially increased. Some rearrangement of priorities may be necessary, in view of the more acute situation developed this week. A large northern Ohio shell forging plant was closed down for three days for lack of steel and is now working at but two-thirds capacity. The effort to have some Government departments prune their schedules has had little success.

Jobbers in iron and steel have increasing reason to fear that the amount of material they can secure will be steadily cut down in the remaining months of the year.

An urgent demand has been put to the railroad car builders for the American Expeditionary Forces, following the recent award of about 24,000

cars. The present call is for 40,315 cars, involving upward of 350,000 tons of steel.

Though this means the further delay of deliveries of rolling stock to home roads, continued close control of traffic is expected to avert the chaos of last winter.

A further statement from the Steel Corporation concerning the eight-hour basic day shows that the rate of pay for Sundays and holidays will be the same as for other days. Thus, in blast furnace labor, where there is a regular force each day of the seven and each man gets one day off in seven, it will be the policy to pay straight rates for eight hours' work on Sunday and time and a half for the additional hours. It is ruled also that tonnage men and piece-workers will receive a 50 per cent higher rate for work done in hours beyond the eight.

One lot of 25,000 Government motor trucks for December-June delivery calls for 22,500 tons of chrome-vanadium steel at a time when alloy steel mills are badly congested with orders. Passenger car builders are not getting steel promised and are making substitutions in spring parts. A leading producer is insisting on consumers accepting steel of 0.06 per cent sulphur resulting from poor coke. Demand for shell steel discard by rolling mills is in excess of the supply.

Orders for France include 150 miles of portable track and 2500 frogs and switches placed with one plant and an Ohio gun plant for new contracts will require 6000 tons of electric chrome nickel steel.

Cast-iron pipe manufacturers spent several days in Washington last week conferring on needs of the Government and on ways and means of getting pig iron, the disposition of officials being to give this industry very little iron. The further concentration of blast furnaces on steel making iron is part of the Government plan.

Low-phosphorus pig iron producers have been in Washington this week. Their ore requirements for this year are assured, but the supply for the first half of 1919 is less certain.

Simplification of export procedure has been provided by a joint arrangement of the War Trade and War Industries boards, and will be appreciated even though no large amount of steel is yet available for general export trade.

It is probable that the increase of Eastern freight rates will be extended to include Buffalo, to keep this iron and steel center on a parity with Pittsburgh, but if new Buffalo rates are to take effect with the others on Nov. 1 an early decision will be necessary.

## Pittsburgh

PITTSBURGH, Oct. 8—(By Wire).

The shortage of steel has become distinctly more pronounced in the past week and several finishing departments are being accorded less steel than formerly. The new war requirements in steel include rails and shell steel chiefly, but there are also new wants in other directions, including barbed wire. Orders of our Allies have materially increased in the past few weeks. The greatest rearrangement in lines

# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

| Pig Iron, Per Gross Ton:      | Oct. 8<br>1918 | Oct. 1<br>1918 | Sept. 10<br>1918 | Oct. 10<br>1917 |
|-------------------------------|----------------|----------------|------------------|-----------------|
| No. 2 X, Philadelphia...      | \$38.85        | \$38.85        | \$34.40          | \$33.75         |
| No. 2, Valley furnace...      | 34.00          | 34.00          | 33.00            | 33.00           |
| No. 2 Southern, Cincinnati... | 37.60          | 37.60          | 36.60            | ....            |
| No. 2, Birmingham, Ala...     | 34.00          | 34.00          | 33.00            | ....            |
| No. 2, furnace, Chicago*      | 34.00          | 34.00          | 33.00            | ....            |
| Basic, deliv., eastern Pa...  | 36.60          | 36.60          | 32.90            | 33.75           |
| Basic, Valley furnace...      | 33.00          | 33.00          | 32.00            | 33.00           |
| Bessemer, Pittsburgh...       | 36.60          | 36.60          | 36.60            | 37.25           |
| Malleable Bess., Chgo*        | 34.50          | 34.50          | 33.50            | ....            |
| Malleable, Valley...          | 34.50          | 34.50          | 33.50            | 33.50           |
| Gray forge, Pittsburgh...     | 34.40          | 34.40          | 33.40            | 32.75           |
| L. S. charcoal, Chicago...    | 38.85          | 38.85          | 37.85            | ....            |

| Rails, Billets, Etc., Per Gross Ton: | Oct. 8<br>1918 | Oct. 1<br>1918 | Sept. 10<br>1918 | Oct. 10<br>1917 |
|--------------------------------------|----------------|----------------|------------------|-----------------|
| Bess. rails, heavy, at mill...       | 55.00          | 55.00          | 55.00            | ....            |
| O-h. rails, heavy, at mill...        | 57.00          | 57.00          | 57.00            | ....            |
| Bess. billets, Pittsburgh...         | 47.50          | 47.50          | 47.50            | 55.00           |
| O-h. billets, Pittsburgh...          | 47.50          | 47.50          | 47.50            | 55.00           |
| O-h. sheet bars, P'gh...             | 51.00          | 51.00          | 51.00            | ....            |
| Forge billets, base P'gh...          | 60.00          | 60.00          | 60.00            | ....            |
| O-h. billets, Philadelphia...        | 51.30          | 51.30          | 51.30            | ....            |
| Wire rods, Pittsburgh...             | 57.00          | 57.00          | 57.00            | 85.00           |

| Finished Iron and Steel,      | Per Lb. to Large Buyers: | Cents | Cents | Cents | Cents |
|-------------------------------|--------------------------|-------|-------|-------|-------|
| Iron bars, Philadelphia...    | 3.73                     | 3.73  | 3.73  | 4.25  | ....  |
| Iron bars, Pittsburgh...      | 3.50                     | 3.50  | 3.50  | ....  | ....  |
| Iron bars, Chicago...         | 3.50                     | 3.50  | 3.50  | ....  | ....  |
| Steel bars, Pittsburgh...     | 2.90                     | 2.90  | 2.90  | ....  | ....  |
| Steel bars, New York...       | 3.145                    | 3.145 | 3.145 | ....  | ....  |
| Tank plates, Pittsburgh...    | 3.25                     | 3.25  | 3.25  | ....  | ....  |
| Tank plates, New York...      | 3.495                    | 3.495 | 3.495 | ....  | ....  |
| Beams, etc., Pittsburgh...    | 3.00                     | 3.00  | 3.00  | ....  | ....  |
| Beams, etc., New York...      | 3.245                    | 3.245 | 3.245 | ....  | ....  |
| Strip, grooved steel, P'gh... | 2.90                     | 2.90  | 2.90  | ....  | ....  |
| Strip, sheared steel, P'gh... | 3.25                     | 3.25  | 3.25  | ....  | ....  |
| Steel hoops, Pittsburgh...    | 3.50                     | 3.50  | 3.50  | ....  | ....  |

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

| Sheets, Nails and Wire,        | Oct. 8<br>1918 | Oct. 1<br>1918 | Sept. 10<br>1918 | Oct. 10<br>1917 |
|--------------------------------|----------------|----------------|------------------|-----------------|
| Per Lb. to Large Buyers:       | Cents          | Cents          | Cents            | Cents           |
| Sheets, black, No. 28, P'gh... | 5.00           | 5.00           | 5.00             | ....            |
| Sheets, galv., No. 28, P'gh... | 6.25           | 6.25           | 6.25             | ....            |
| Wire nails, Pittsburgh...      | 3.50           | 3.50           | 3.50             | ....            |
| Cut nails, Pittsburgh...       | 4.00           | 4.00           | 4.00             | ....            |
| Fence wire, base, P'gh...      | 3.25           | 3.25           | 3.25             | ....            |
| Barb wire, galv., P'gh...      | 4.35           | 4.35           | 4.35             | ....            |

| Old Material, Per Gross Ton:  | Oct. 8<br>1918 | Oct. 1<br>1918 | Sept. 10<br>1918 | Oct. 10<br>1917 |
|-------------------------------|----------------|----------------|------------------|-----------------|
| Carwheels, Chicago...         | \$29.00        | \$29.00        | \$29.00          | \$27.00         |
| Carwheels, Philadelphia...    | 29.00          | 29.00          | 29.00            | 29.00           |
| Heavy steel scrap, P'gh...    | 29.00          | 29.00          | 29.00            | 30.00           |
| Heavy steel scrap, Phila...   | 29.00          | 29.00          | 29.00            | 25.00           |
| Heavy steel scrap, Chgo...    | 29.00          | 29.00          | 29.00            | 26.00           |
| No. 1 cast, Pittsburgh...     | 29.00          | 29.00          | 29.00            | 29.00           |
| No. 1 cast, Philadelphia...   | 29.00          | 29.00          | 29.00            | 28.00           |
| No. 1 cast, Chgo, net ton...  | 30.36          | 30.36          | 30.00            | 21.00           |
| No. 1 RR. wrot., Phila...     | 34.00          | 34.00          | 34.00            | 38.00           |
| No. 1 RR. wrot., Chgo, net... | 30.36          | 30.36          | 29.75            | 27.00           |

| Coke, Connellsville, Per Net Ton at Oven: | Oct. 8<br>1918 | Oct. 1<br>1918 | Sept. 10<br>1918 | Oct. 10<br>1917 |
|---|----------------|----------------|------------------|-----------------|
| Furnace coke, prompt...                   | \$6.00         | \$6.00         | \$6.00           | ....            |
| Furnace coke, future...                   | 6.00           | 6.00           | 6.00             | ....            |
| Foundry coke, prompt...                   | 7.00           | 7.00           | 7.00             | ....            |
| Foundry coke, future...                   | 7.00           | 7.00           | 7.00             | ....            |

| Metals,                         | Per Lb. to Large Buyers: | Cents  | Cents  | Cents | Cents |
|---------------------------------|--------------------------|--------|--------|-------|-------|
| Lake copper, New York...        | 26.00                    | 26.00  | 26.00  | 23.50 | ....  |
| Electrolytic copper, N. Y...    | 26.00                    | 26.00  | 26.00  | 23.50 | ....  |
| Spelter, St. Louis...           | 8.85                     | 9.05   | 9.25   | 8.00  | ....  |
| Spelter, New York...            | 9.20                     | 9.40   | 9.50   | 8.25  | ....  |
| Lead, St. Louis...              | 7.75                     | 7.75   | 7.75   | 7.45  | ....  |
| Lead, New York...               | 8.05                     | 8.05   | 8.05   | 7.60  | ....  |
| Tin, New York...                | 82.00                    | 82.00  | 83.00  | 61.00 | ....  |
| Antimony (Asiatic), N. Y...     | 14.00                    | 14.00  | 14.00  | 15.00 | ....  |
| Tin plate, 100-lb. box, P'gh... | \$7.75                   | \$7.75 | \$7.75 | ....  | ....  |

of production that has occurred has been at the Edgar Thomson Steel Works of the Carnegie Steel Company. This plant, while at one time exclusively a rail mill, had of late been producing other products and but a small tonnage of rails. With the heavy demand for rails, it has been necessary to cut very sharply the output of some other products, particularly sheet bars for sheet and tin plate mills.

There is no information in steel circles that would indicate that the War Industries Board has any opportunity to decrease its former estimates as to the amount of steel required in the current half year, the estimate for some time past having been 23,000,000 net tons at least, with a possible 25,000,000 tons. All the conservation measures adopted, apparently, are more than overbalanced by the new demands that have appeared, chiefly from the American Expeditionary Force and the Allies. As matters stand at present, the orders that will be filled by Dec. 31 depend on the degree of priority accorded them, so that some relatively important lines of consumption would possibly receive no steel at all, and some rearrangements in priorities may accordingly be forced. Something may be accomplished by requiring a more rigid observance of the regulations, as there are suspicions that some mills have been interpreting the regulations rather broadly and by cutting off deliveries to lines of consumption that take the lower orders would be able to take care of more high priority orders.

The so-called "Spanish influenza" has been in Pittsburgh for nearly a week, but until to-day the epidemic has not been severe. Reports to-day, however, are of many cases, and the outlook is very serious. Thus far the disease has not been reported from the mill towns to any extent, but fears are naturally entertained. Reports have it that an Eastern plant has a large proportion of its working force incapacitated.

The 8-hr. basic day as adopted in the iron and steel industry generally is that time and a half will be paid for any hours exceeding eight for any one working

day and that Sundays and holidays will be regarded the same as any other day with respect to work that is regularly prosecuted on such days. Apparently there are some details still to be worked out, affecting only a very small proportion of the men. In such important cases as that of blast furnace labor where there is a regular force each day of the seven and each man gets one day off in the seven, it is established that work on Sunday will be paid straight rates for eight hours and time and a half for the additional hours. In such cases many men prefer to work Sunday and take their day off during the week.

**Pig Iron.**—The rate of pig-iron production has continued to increase steadily with very favorable weather conditions and with some improvement reported here and there in the quality of coke available. There remains much complaint about coke quality. Practically no new business is being put through, as the distribution of pig iron is closely controlled and consumers who want additional iron can only get it by making out a strong case for securing an allocation through the War Industries Board and the pig iron committee.

Basic pig iron, \$33; Bessemer, \$35.20; gray forge \$33; No. 2 foundry, \$34; No. 3 foundry, \$33.50, and malleable \$34.50, all per gross ton at Valley furnace the freight rate for delivery in the Cleveland and Pittsburgh district being \$1.40 per ton.

**Billets and Sheet Bars.**—The supply of sheet bars on contracts has been decreasing sharply for several weeks and supplies in the past few days have been the smallest for a long time. The decrease is due chiefly to the larger tonnages of rails required from plants that make both rails and sheet bars. Supplies of billets are approximately the same as formerly. There is practically no tonnage of billets or sheet bars available for purchase even under favor of the Government, and it is only occasionally that a small lot of discard steel becomes available. Under the recent order that sales on unfinished steel must be made direct from producer to consumer, middlemen are not permitted to purchase unfinished steel and then sell it again unless they can



arrange to have it put through a process of manufacture while it is their hands. It does not appear from the regulations, however, that a middleman would be prevented from acting as a broker provided he acted merely as a broker to bring buyer and seller together and got his commission from the seller and not from the buyer in case the sale was made at the full Government price.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$47.50. and bars \$51, forging ingots \$73, and forging billets \$60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

**Plates.**—The War Industries Board has made it clear that it does not expect to decrease the allotment of plates to the Emergency Fleet Corporation, but rather to increase the supply upon occasion. Assurances have been given in the past few days that the matter of equipment for vessels, which for several months has been the bottle neck in ship construction, is now in a much more favorable condition and it is expected that boilers, engines and other appurtenances will in future be supplied in such volume that it will be possible to finish the large number of hulls accumulated in recent months and also to take care of hull launchings at a greater rate than has thus far obtained. At the present time, however, there is a reservoir of plates awaiting employment in hulls. We quote sheared plates at 3.25c. Pittsburgh mill for fourth quarter.

**Ferroalloys.**—There continues to be a fair degree of activity in ferromanganese for first half delivery, but there does not seem to be any uneasiness on the part of consumers as to their requirement being taken care of. Spiegeleisen continues rather quiet.

We quote 70 per cent ferromanganese at \$250 delivered, 16 per cent spiegeleisen at \$75 at furnace and 50 per cent ferrosilicon for prompt shipment at \$160 and for delivery over the last half of the year, \$150 to \$155 at furnace, the furnaces usually absorbing the freight.

We quote 9 per cent Bessemer ferrosilicon at \$55; 10 per cent, \$57; 11 per cent, \$60.30; 12 per cent, \$63.60. We quote 6 per cent silvery iron, \$42; 7 per cent, \$43; 8 per cent, \$45.50; 9 per cent, \$47.50; 10 per cent, \$50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2.90 per gross ton, for delivery in the Pittsburgh district.

**Structural Material.**—No new orders of importance are reported in the structural field. By far the major portion of the output of the structural mills is in material for the Fleet Corporation and material for steel freight cars and such orders are on books for a long time to come.

We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh, for fourth quarter.

**Sheets.**—On account of the decreased supply of sheet bars, the majority of sheet mills are running on leaner schedules than formerly and the average for the entire industry is not over 50 per cent of capacity. The leading interest is running at considerably less than 50 per cent, but some of the independents are running at 60 per cent or more, the regulating influence being entirely the supply of sheet bars. It is possible that some reallocation of war orders for sheets will be necessitated by the circumstances, as some mills can do scarcely more than take care of class AA and class A priorities while others work fairly well through class B priorities and in some instances are able to ship a little tonnage against the preference list. Prices on sheets are given in detail on page 925.

**Tin Plates.**—Tin plate production last week averaged less than 70 per cent of capacity and production promises to be still lighter. Thus far the restrictive influence has been the scant supply of sheet bars. When the order of Sept. 5 was promulgated that the tin plate mills should run at not over 70 per cent during the fourth quarter, some of the sheet bar mills acted at once in beginning to cut their sheet bar rolling. A further restrictive influence in tin plate production will be the limited uses permitted for it. The mills can ship only on Government orders and against orders that will be made into food containers and these outlets are not sufficient to take care of even 70 per cent of the capacity. The Food Administration has been engaged for some time in making agreements with food packers to limit their consumption of tin plate, but these arrange-

ments refer particularly to next year. At present, tin plate is permissible for all food products except beans. We quote tin plate at \$7.75 per base box for fourth quarter. Prices on terne plates are given on page 925.

**Iron and Steel Bars.**—There has been a slight curtailment in supplies of steel for merchant mills in general and output of steel bars is restricted somewhat more. By the arrangement recently made between the War Industries Board and the Agricultural Implement makers, the latter are to use not more than three-fourths as much iron and steel in the 12 months beginning this month as in the previous 12 months, but considerable latitude is allowed as to where the saving is to be made and the implement manufacturers may possibly save more in pig iron tonnage than in steel bar tonnage.

We quote soft-steel bars rolled from billets at 2.90c.; from old steel rails, 3c.; and refined iron bars at 3.50c. at mill, Pittsburgh, for fourth quarter.

**Cotton Ties.**—The distributing season for cotton ties is now nearly over and the mills have already rolled practically all that will be required.

We quote cotton ties for October shipment at \$1.96 per bundle of 45 lb. f.o.b. Pittsburgh.

**Shafting.**—Steel supplies to shafting makers continue to be restricted to the amount needed for filling the most important orders and while the flow of material to the automobile trade is reduced, it is improbable that there will be any increase in supplies to other trade in consequence. The greatest scarcity is in large sizes.

For third quarter we quote cold-rolled shafting at 17 per cent off list in carloads and 12 per cent in less than carloads, f.o.b. Pittsburgh, for fourth quarter.

**Rivets.**—Production of rivets continues to be confined almost exclusively to priority orders, chiefly for the Fleet Corporation, Navy and other Government requirements.

We quote button-head structural rivets at \$4.40, conehead boiler rivets at \$4.50 per 100 lb. Small rivets are 50 and 10 per cent off list for fourth quarter, f.o.b. Pittsburgh.

**Nuts and Bolts.**—Producers report that they are accepting practically no business except such as is entitled to priority classification and production is rather limited in consequence. Prices are given on page 925.

**Spikes.**—Demand is in excess of current output, as spike makers are limited in steel supplies. The most pronounced shortage is in small spikes. Producers have undertaken to furnish standard spikes to railroads to take care of all rails that may be furnished by the rail mills.

Standard sizes of railroad spikes 9/16 x 4 1/4 in. and larger, \$3.90 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, \$5.25 per 100 lb.; rack bolts, \$4.90 base in lots of 200 kegs or more; less than 200 kegs lots, \$1 per 100 lb. extra. All f.o.b. Pittsburgh.

**Boiler Tubes.**—With the decrease in pressure for standard boiler tubes that has occurred in the past few weeks, the producers are in better shape and are now able to take care of nearly all priority orders without much difficulty. Considerable capacity is being employed in making tubes for trench mortars. Discounts on boiler tubes are given on page 925.

**Cold-Rolled Strip Steel.**—There is no change in market conditions. Prices are on the basis quoted last week, the freight allowance having been eliminated by the recent decision of the American Iron and Steel Institute.

We quote cold-rolled strip steel at \$6.50 base per 100 lb. f.o.b. Pittsburgh, for 1 1/2-in. and wider, 0.100 in. and thicker, hard temper in coils under 0.20 carbon. Boxing charge 50c per 100 lb.

**Wire Rods.**—Production of wire rods continues at about 50 per cent of capacity and is not likely to be increased. Prices of wire rods are given on page 925.

**Hoops and Bands.**—Production of hoops and bands continues at not over about 50 per cent of capacity, but there is no pronounced scarcity in comparison with that existing in some other finished steel products, as the commercial demand has greatly decreased in the past few months. Hoops and bands remain on the basis of 3.50c. for fourth quarter.

**Wrought Pipe.**—The War Industries Board has not imposed any additional restrictions on the production of welded tubular goods, but the production is limited by

steel supplies to such an extent that mills are falling farther behind. As a rule, mills are making shipments on B-4 priorities, after taking care of higher degrees of priority, but are not able to make full shipments to jobbers, whose material is the chief item in B-4. In fact, the mills fell farther short of shipping jobbers' September quotas than they did in the case of their August quotas and the combined deficiencies of the two months are carried over into October. The War Industries Board has now notified the trade that it expects oil country goods to be given B-2 rating as a regular practice, this conforming to the rating accorded in circular No. 4 promulgated in July and providing for automatic priority. It is ruled further that oil country goods distributed by jobbers shall be in a separate class, having nothing to do with jobbers' distribution of standard steel pipe. Compliance with this order is expected to result in a larger supply of oil country goods and a correspondingly smaller supply of standard steel pipe, as the mills have only so much steel to put into these tubular goods in general. Discounts on iron and steel pipe are given on page 925.

**Old Material.**—Offerings of scrap to producers are approximately as heavy as formerly, but the offerings are nearly all direct, the dealers having difficulty in getting hold of any material. Mills are very far from being satisfied with the descriptions of scrap offered them, but in point of tonnage the offerings are not entirely unsatisfactory. There is less complaint about scrap shortage than there was a month or two ago when so many mills were attempting to gather up a winter supply. There continue to be reports of dealers offering to split commissions with other dealers although this is distinctly prohibited in the regulations. The Pennsylvania Railroad has issued a special circular to the trade, showing the total quantities of scrap of various grades it has had for sale during the past four months, and asking whether the recipient of the circular would like to make a contract to purchase any of the items during a period of from three to six months, subject to the prices ruling by authority of the American Iron and Steel Institute, while the contract would be subject to cancellation should it be found later to be in conflict with orders of the director general. Payment would be required within five days of date of invoice. Dealers feel that it would be impossible for them to make such contracts, but it is quite possible the proposal will appeal to many consumers. Very little of the Pennsylvania Railroad scrap has been handled by dealers for some time past. We quote:

|   |                  |
|---|------------------|
| Heavy steel melting scrap, Steubenville, Folsom, Brackenridge, Monessen, Midland and Pittsburgh, delivered..... | \$29.00          |
| No. 1 cast scrap (for steel plants).....  | 29.00            |
| Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh.....               | 34.00            |
| Hydraulic compressed steel scrap.....   | 29.00            |
| Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district.....                          | \$27.50 to 29.00 |
| Bundled sheet stamping scrap.....   | 22.00 to 23.00   |
| No. 1 bushing scrap.....  | 28.00 to 29.00   |
| Railroad grate bars.....  | 18.00 to 19.00   |
| Low phosphorus melting stock (unguaranteed).....  | 34.00            |
| Low phosphorus melting stock (guaranteed).....  | 36.50            |
| Low phosphorus melting stock (bloom and billet ends, heavy plates).....   | 39.00            |
| Iron car axles.....   | 46.00 to 46.50   |
| Locomotive axles, steel.....  | 46.00 to 46.50   |
| Steel car axles.....  | 46.00 to 46.50   |
| Railroad malleable (for malleable works).....   | 34.00            |
| Machine shop turnings.....  | 19.00            |
| Cast iron wheels.....   | 29.00            |
| Roller steel wheels.....  | 36.00            |
| Sheet bar crop ends (at origin).....  | 35.00            |
| Cast iron borings.....  | 19.00            |
| No. 1 railroad wrought scrap.....   | 34.00            |
| Heavy steel axle turnings.....  | 24.00            |
| Heavy breakable cast scrap.....   | 28.00 to 29.00   |

**Coke.**—Coal supplies to by-product ovens are running a trifle heavier and the ovens are doing fairly well as to current operations, but they find it quite impossible to accumulate the reserves they would like to have against the winter. Shipments of Connellsville coal to by-product ovens are increasing steadily, but slowly, while the output of beehive coke at the plants is at an approximately stationary rate. By the new system of

car distribution that goes into effect Oct. 10, all coal mines will be rated each month in accordance with their shipments the previous month after allowance has been made for idleness, the shipments being divided by the working time and multiplied by the full time, while in the case of coke works that ship coal the basis is simply the quantity of coal shipped. No furnace coke is coming into the open market, as contracts and allocations take up all the production. Offerings of foundry coke are somewhat limited, but appear to be sufficient to take care of essential foundry operations. Production of coke screenings from old dumps has decreased since the Government limit was reduced to \$5.50, for clean material passing over a ½ in. screen, but there is still a fair trade for this material. Output of coke in the Connellsville and lower Connellsville region in the week ended Sept. 28 was 335,195 tons, a decrease of 4280 tons and shipments of coal were 245,136 tons, an increase of 22,733 tons.

We quote 48-hr. blast-furnace coke at \$6; 72-hr. foundry, \$7, and crushed coke over ¾ in. at \$7.30, all in net tons of 2600 lb. at oven.

There is a danger in riveting steam boilers by hydraulic pressure, that the pressure on the cup may be released before the shank of the rivet has had time to cool. In such an event the plates may spring apart to such an extent, that the shrinkage of the rivet in cooling is not sufficient to ensure a tight seam. According to *The Engineer*, London, a description was recently published in a German technical paper, of an autographic recorder designed to overcome this possible defect of hydraulic riveting. Pressure upon the warm head of the rivet is transmitted through piping to clockwork and sets a pointer in motion until the required pressure is reached. This pressure is kept constant until a pre-determined number of seconds has passed, when a red pointer indicates that the pressure may be released, and the pointer returns to zero. This result is graphically recorded upon a traveling paper band, from which the pressure and the period of compression can easily be read.

"The Diesel Engine, Its Fuels and Its Uses," by Herbert Haas is the subject of Bulletin 156 issued by the United States Bureau of Mines. The pamphlet was written in an effort to obtain a more general use of the Diesel engine because of its importance as a device for insuring more efficient utilization of petroleum and coal-tar products, consuming as it does, heavy liquid fuels such as cannot be utilized in other types. For some uses this engine is replacing gas and gasoline engines but its most important duty will be to replace the wasteful consumption of fuel oil in steam engines. Not only will a wider use of the Diesel engine relieve the demand, but it will result in more power being obtained from the same consumption of fuel oils. In this report the author discusses recent developments in the design and construction of the Diesel engine, the fuels suitable for burning in it and the uses to which it is particularly adapted. The subject is exhaustively treated, numerous illustrations and charts adding largely to the value of the publication.

A 16-page pamphlet of the 6 x 9-in. size entitled "Boxing Machinery" has been issued by the Brown & Sharpe Mfg. Co., Providence, R. I. The pamphlet is an extract of an article by Luther D. Burlingame which recently appeared in *Industrial Management* and outlines the practice of the company in packing machinery and tools for local, domestic and foreign shipment. As a typical example of the precautions observed to prevent damage, descriptions of the packing of a vertical milling and a universal grinding machine are presented with numerous illustrations. The precautions to be observed against rust and the prevention of loss of parts and thieving are touched upon and instructions for invoicing and marking are given.

The Aetna Explosives Co. has given a 10 per cent increase in wages to the 550 employees of its plant at Gary, Ind., effective Oct. 1.



## Chicago

CHICAGO, Oct. 7.—(By Wire.)

The subject of most concern to the iron and steel mills at this time is that of re-arranging the compensation of workers to fit the basic 8-hr. day, which, as heretofore reported, the independent mills will adopt, thus following the United States Steel Corporation. Many details remain to be worked out and it is these with which mill managers are concerned. Tonnage men, superintendents, foremen, etc., are all affected. It would not do to have a workman receive more than his foreman, not only because the foreman would be dissatisfied, but because those under him would not hold him in the proper respect. There is a pronounced feeling that the labor situation may be difficult to control because usually the more the men have the more they want. Also to be considered is the fact, so often commented on, that high wages do not operate to keep all employees steadily at work. Having earned enough to see themselves through, many take time off.

Governmental pressure for shell steel and material for the Emergency Fleet Corporation is greater than ever. To obtain any kind of near delivery of bars, plates and shapes, class A priority rating is required, although sheets can be had on a class B priority. Akron, Ohio, is in the market for 5350 tons of cast iron pipe.

**Pig Iron.**—The situation continues a disturbing proposition, iron being placed solely for war needs. The principal Southern furnaces have not yet authorized their agents to accept new business, although a tendency to do so is becoming more tangible. One furnace, for instance, noting the comparative amount of war business which some of its customers have reported and with which their shipments are commensurate, has asked that such consumers be canvassed in an effort to learn whether they have fully stated the percentage of war business in their foundries. Northern producers continue to place iron principally for first half on the basis referred to. The Jackson Iron & Steel Co., Jackson, Ohio, announces that it is now making silvery, being off Bessemer ferrosilicon for the time being. In the table below, the quotation for 7 per cent silvery is revised to read \$50, the price quoted last week having failed to take account of Tennessee furnaces selling on the Birmingham base. Production in this district is at an excellent rate. One of the two furnaces of the Illinois Steel Co. at Bayview, Wis., is still idle, although it has been ready for operation for a year. It would be operating were materials available.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

|  |                    |
|--|--------------------|
| Lake Superior charcoal, Nos. 2 to 5..                                    | \$38.70 to \$39.00 |
| Northern coke foundry, No. 1, silicon, 2.25 to 2.75 .....                | 35.25              |
| Northern coke foundry, No. 2, silicon, 1.75 to 2.25 .....                | 34.00              |
| Northern high-phosphorus foundry .....                                   | 34.00              |
| Southern coke, No. 1 foundry and No. 1 soft, silicon, 2.75 to 3.25 ..... | 42.00              |
| Southern coke, No. 2 foundry, silicon, 2.25 to 2.75 .....                | 40.25              |
| Southern foundry, silicon, 1.75 to 2.25 .....                            | 39.00              |
| Malleable, not over 2.25 silicon .....                                   | 34.50              |
| Basic .....  | 33.00              |
| Low phosphorus (copper free) .....                                       | 54.00              |
| Silvery, 7 per cent .....  | 50.00              |

**Ferroalloys.**—A local interest will this week offer a limited quantity of 70 per cent ferromanganese Spiegel-eisen continues in fairly active demand from the foundries. The leading producer of electro ferrosilicon is expected to open its books for next year this week.

We quote 70 per cent ferromanganese at \$250, delivered; 50 per cent ferrosilicon at \$150 to \$160, delivered, and 16 to 18 per cent spiegeleisen at \$75, furnace.

**Structural Material.**—There is plenty of demand for shapes, but with more and more shell steel being called for deliveries are more remote than ever, and what can be supplied promptly must go to the Emergency Fleet Corporation. The corporation placed about 6000 tons with an independent company to-day. The producer in question has just placed an additional structural mill

on shell steel. The United States Government has placed with Christopher & Simpson, St. Louis, an order for 11,000 tons of steel for a machine shop and heat treating building at St. Louis. While the Des Moines Bridge & Iron Co. has been placed 992 tons by the Bureau of Yards and Docks for a United States Government machine shop at Mare Island, Cal. The American Bridge Co. will supply 290 tons of miscellaneous steel work for the 95th Street subway, Chicago, the order being placed by the U. S. Railroad Administration for the Illinois Railroad.

The official mill quotation is 3c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.27c. for material out of warehouse.

**Plates.**—Companies in Wisconsin and Michigan which have contracts for airplane bombs are in the market for light plates, usually  $\frac{1}{4}$  and  $\frac{1}{2}$  in., and it is needless to say their wants will be promptly cared for. Meanwhile the Government continues to press hard for material for the Emergency Fleet Corporation.

The official mill quotation is 3.25c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers who have stock quote 4.52c.

**Bars.**—Priorities in some rank in A class are necessary to procure mild steel bars, although the situation with them is less acute than in plates and shapes. The bar iron mills continue to improve their position by booking orders which under other conditions would go to steel mills. As pointed out elsewhere, few re-rolling rails are coming out, and the rail-carbon bar mills are producing accordingly.

Mill prices are: Mild steel bars, 2.90c. Pittsburgh taking a freight rate of 27c. per 100 lb.; discard bars, 3.25c. Chicago; bar iron, 3.50c. Chicago; rail carbon, 3c. Chicago.

Jobbers quote soft steel bars 4.17c., bar iron 4.17c., for  $\frac{1}{4}$  in. thick and heavier. Reinforcing bars, 4.29 $\frac{1}{2}$ c. base. Under the new price there is no charge for twisting, but extras for sizes are quoted as per card. Shafting, list plus 13 per cent.

**Sheets.**—This product can be obtained on a class B priority. Local mills are operating but 60 per cent of capacity and would like to continue at least on that basis, as it will enable them to keep their working forces intact. At the same time, they realize that a more acute shortage of shell steel will hit sheets first and hardest. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 925. Jobbers quote:

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.52c.; No. 28 black, 6.52c., and No. 28 galvanized, 7.77c.

**Rails and Track Supplies.**—Shipments of rails in September by the local producer were the heaviest of any month this year.

Standard railroad spikes, 3.90c., Pittsburgh. Track bolts, with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c.; f.o.b. maker's mills. The base for light rails is 3c., f.o.b. maker's mill, for 25 to 45-lb. sections, lighter sections taking Government extras.

**Wire Products.**—Under severe restrictions, nails, poultry fencing and some other products are being distributed. The production of nails can not be increased and it may be cut down. Supplied first of all is the enormous Government demand for barbed wire. For prices see finished iron and steel, f.o.b. Pittsburgh, page 925.

**Cast Iron Pipe.**—The expected Akron, Ohio, inquiry is out, and it is a large one, calling for 5350 tons of 30 and 48-in. pipe for waterworks improvements. No other requests for bids or lettings are announced. Pipe shop operations would be decidedly slow were it not for special Government work which keeps them fairly busy.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$69.80; 6-in. and larger, \$66.80. Class A and gas pipe, \$1 extra.

**Bolts and Nuts.**—The makers report no change in the situation, their great concern being in getting raw material, and to this end they require affidavits as to the essential nature of every job, even where old contracts are in force. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 925. Jobbers quote:

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 37 $\frac{1}{2}$  per cent off; larger sizes 25 and 5 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 32 $\frac{1}{2}$  off; larger sizes, 20 off; box pressed nuts, square, tapped, 78c. off; hexagon tapered, 58c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

**Old Material.**—With nearly all prices at allowable maximum levels, no changes are reported. The market



continues as active as it can be with limited quantities of material available. Steel mills are eager for melting steel, inquiries coming here from Ohio and Missouri as well as from local points. More railroads have lists out than has been the case in many months, although the majority are small, and few contain any rerolling rails. The lists are from the Santa Fe, C. B. & Q., L. E. and W., Northern Pacific, Wabash, Soo Line and Pere Marquette.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

|  |                  |
|--|------------------|
| Old iron rails.....                        | \$39.00          |
| Relaying rails.....                        | \$55.00 to 60.00 |
| Old carwheels.....                         | 29.00            |
| Old steel rails, rerolling.....            | 34.00            |
| Old steel rails, less than 5 ft.....       | 34.00            |
| Heavy melting steel.....                   | 29.00            |
| Frogs, switches and guards, cut apart..... | 29.00            |
| Shoveling steel.....                       | 29.00            |
| Heavy steel axle turnings.....             | 24.00            |

#### Per Net Ton

|                                       |                |
|---------------------------------------|----------------|
| Iron angles and splice bars.....      | \$34.82        |
| Iron arch bars and transoms.....      | 41.52          |
| Steel angle bars.....                 | 30.36          |
| Iron car axles.....                   | 41.52          |
| Steel car axles.....                  | 41.52          |
| No. 1 railroad wrought.....           | 30.36          |
| No. 2 railroad wrought.....           | 29.46          |
| Cut forge.....                        | 29.46          |
| Pipes and flues.....                  | 25.89          |
| No. 1 busheling.....                  | 27.63          |
| No. 2 busheling.....                  | 20.00          |
| Steel knuckles and couplers.....      | 30.36          |
| Coil springs.....                     | 30.36          |
| No. 1 cast scrap.....                 | 30.36          |
| Boiler punchings.....                 | 32.59          |
| Locomotive tires, smooth.....         | 40.50 to 41.50 |
| Machine-shop turnings.....            | 16.50 to 16.96 |
| Cast borings.....                     | 16.50 to 16.96 |
| Stove plate and light cast scrap..... | 25.50 to 25.89 |
| Grate bars.....                       | 25.50 to 25.89 |
| Brake shoes.....                      | 25.50          |
| Railroad malleable.....               | 30.36          |
| Agricultural malleable.....           | 29.00 to 30.00 |
| Country mixed scrap.....              | 22.50 to 23.00 |

## Philadelphia

PHILADELPHIA, Oct. 8.

A serious shortage of iron and steel scrap is now a factor with which steel plants, iron-rolling mills and foundries have to reckon. The situation has become such that the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute is allocating scrap freely to help out plants in distress. Scrap is being imported from Panama, through the assistance of the Navy Department, for the relief of consumers most urgently in need. Two boatloads, totaling 8000 tons, have arrived, but in the aggregate, of course, not much help can be expected in that direction because of the shortage of shipping space. Naval colliers were used to bring the material which arrived last week. The shortage of foundry pig iron is also assuming more serious proportions, and many foundry consumers complain of insufficient supply.

The epidemic of Spanish influenza quite seriously affected steel production in this district last week, and apparently the worst is not over yet. Many workmen have succumbed to the illness. In one nearby plant, several open-hearth furnaces were forced out and two jobbing mills were shut down temporarily because of lack of men to operate them.

None of the steel companies having headquarters here has yet adopted the 8-hr. working day in line with the recent announcement of the United States Steel Corporation, but it is admitted that all will undoubtedly do so as soon as the details of the Steel Corporation plan are known. Steel manufacturers have received a notice from E. A. S. Clarke, secretary of the Committee on Steel and Steel Products of the American Iron and Steel Institute, dated Oct. 3, that this committee deemed it inadvisable to act for the steel trade in labor matters. The letter said further that details of the Steel Corporation plan had not been fully announced, but that Judge Gary had stated that the time and a half overtime pay would apply to men working on tonnage and piecework basis, as well as those paid by the hour, and that on Sundays time and a half would be paid only for work in excess of eight hours.

Some of the steel companies have received notice

from the steel section, War Industries Board, to ship only on A priorities. Pressure at Washington is strong—est for plates, shell steel and rails.

**Pig Iron.**—No decision has yet been announced as to whether the water competitive freight rate of \$5.30 or the all-rail rate of \$6.80 from Birmingham to Camden and Burlington, N. J., and other points near by will rule on shipments of pig iron from Virginia furnaces. Sellers of iron have referred this question to the War Industries Board, which has in turn referred it to H. G. Dalton, chairman of the Committee on Iron Ore, Pig Iron and Lake Transportation of the American Iron and Steel Institute. At this writing, Mr. Dalton has not signified which rate should be applied. Another question which has arisen is, who pays the war freight tax, the seller or the buyer? The answer, as given by sellers of iron, is that the buyer must stand this tax inasmuch as iron prices are not on a delivered basis but on the basis of f.o.b. furnace. H. G. Dalton has given furnaces several examples of the correct way of billing shipments in iron, in each case the net price being an f.o.b. furnace price. For example, No. 2 foundry iron is \$34 f.o.b. Birmingham; the freight rate from Birmingham to Philadelphia, \$6.50, is added to the Birmingham base price, and the freight rate of \$4.10 from Virginia furnace to Philadelphia is then deducted, leaving the net price \$36.40, f.o.b. Virginia furnace. Thus, the buyer pays the freight from Virginia furnace plus the freight tax. The shortage of foundry pig iron seems to be growing more serious as allocations increase and there is a great deal of complaint from consumers. Furnaces working on basic iron are not permitted to turn to foundry nor are furnaces working on foundry iron permitted to turn to any other grade. The fact that there is now a plentiful supply of both ferromanganese and spiegeleisen brings forth the suggestion from several sources that a few of the furnaces making these alloys should be diverted to iron production, at least for a short time. The quotation of \$50 f.o.b. furnace for copper-bearing low phosphorus iron in last week's report was an error; it should have been \$51. We quote standard grades of iron for delivery in Philadelphia, except low phosphorus grades, for which f.o.b. furnace prices are quoted:

|  |         |
|--|---------|
| Eastern Pennsylvania No. 1 X.....                    | \$40.60 |
| Eastern Pennsylvania No. 2 X.....                    | 33.85   |
| Eastern Pennsylvania No. 2 foundry.....              | 37.00   |
| Virginia No. 2 X.....                                | 41.75   |
| Virginia No. 2 foundry.....                          | 40.50   |
| Basic.....   | 36.60   |
| Gray forge.....                                      | 36.60   |
| Bessemer.....  | 33.80   |
| Standard low phosphorus (f.o.b. furnace)....         | 64.00   |
| Low phosphorus (copper bearing, f.o.b. furnace)..... | 51.00   |

**Ferroalloys.**—The output of ferromanganese and spiegeleisen is greater than present demand, and the market for these alloys is weak. There are reports which cannot be verified that spiegeleisen has been sold at \$75, delivered. We quote 70 per cent ferromanganese at \$250, delivered, and 16 to 18 per cent spiegeleisen at \$75, f.o.b. furnace, \$3.50 being the unit price on both alloys for variations from these standards.

**Coke.**—The coke situation shows no radical change, but furnace operators are hopeful of getting a better quality of coke as a result of the recent conference in Washington on pig iron production. A Philadelphia steel company reports that it is already noting some improvement in coke quality, and partially as a result of this, its blast furnace operation last week was at 100 per cent. We quote 48-hr. blast furnace coke at \$6 and 72-hr. foundry coke at \$7, f.o.b. Connellsville.

**Billets.**—A Pennsylvania steel company has received an order from the Government for 21,000 tons of Gothic billets for shells there being for nearby shell plants. We quote open-hearth rerolling billets at \$51.30, Philadelphia.

**Old Material.**—A serious shortage of iron and steel scrap is claiming the attention of the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute, and allocations are being freely made to help out consumers. When an emergency arises the sub-committee takes material wherever it can be found and ships it to plants requiring it badly. An eastern

Pennsylvania plate mill has thus had a serious shortage relieved within the past week. Two boatloads of old material from Panama, a total of about 8000 tons, which arrived a few days ago, came to port at an opportune time to help out this and other steel plants, particularly those in northern Ohio. Naval colliers brought the scrap from Panama. More will arrive soon. The position of the scrap dealer is becoming more and more precarious. Consumers are learning of sources of supply near their plants and whenever possible are eliminating the broker and saving the 3½ per cent commission which he receives. Producers of scrap in New England, Virginia and in other sections distant from eastern Pennsylvania are finding it easy to sell their scrap close at hand, and much of the material from these sections which formerly came to eastern Pennsylvania does not now reach here at all. A prominent scrap dealer says he will be satisfied if from now until the end of the war he can make a sufficient profit to keep his organization intact for after-the-war business. Large profits for scrap dealers are no longer possible, and as scrap becomes scarcer profits grow smaller. The Pennsylvania Railroad, Eastern Lines, which has sold its scrap each month, has sent out a notice to dealers, brokers and consumers that it will hereafter sell on contract. The letter is accompanied by a list showing the tonnages of scrap which have been sold from various Pennsylvania shops during the past four months. While the railroad does not obligate itself to furnish the tonnages specified as having been sold during the past four months, it will endeavor to do so so far as practicable, and the prices to be paid are the maximum figures agreed upon between the representatives of the Government and the American Iron and Steel Institute. Under the proposed contracts, it will be necessary for the buyers to give the railroad standing shipping instructions to permit of shipments being made at any and all times in carload lots as accumulated. Tenders will be received up to 9 o'clock Friday a. m., Oct. 11, and should be addressed to the attention of desk No. 25, purchasing department, Pennsylvania Railroad. We quote for delivery in Philadelphia and nearby points, as follows:

|   |                  |
|---|------------------|
| No. 1 heavy melting steel.....  | \$29.00          |
| Steel rails, rerolling .....  | 34.00            |
| No. 1 low phosphorus, heavy, 0.04 and under..                         | 39.00            |
| Low phosphorus, 0.04 and under.....                                   | 36.50            |
| Low phosphorus, 0.06 and under....                                    | \$32.00 to 34.00 |
| Old iron rails .....  | 39.00            |
| Old carwheels .....   | 29.00            |
| No. 1 railroad wrought.....   | 34.00            |
| No. 1 yard wrought.....   | 33.00            |
| Country yard wrought .....  | 29.00            |
| No. 1 forge fire.....   | 29.00            |
| Bundled skeleton .....  | 29.00            |
| No. 1 busheling.....  | 31.00            |
| No. 2 busheling.....  | 19.00 to 20.00   |
| Turnings (for blast furnace use).....                                 | 19.00            |
| Machine-shop turnings (for rolling mill use)..                        | 19.00            |
| Cast borings (for blast furnace use).....                             | 19.00            |
| Cast borings (clean).....   | 19.00            |
| No. 1 cast (for steel plant use).....                                 | 29.00            |
| No. 1 cast (cupola sizes).....  | 34.00            |
| Grate bars .....  | 28.00 to 29.00   |
| Stove plate .....   | 28.00 to 29.00   |
| Railroad malleable (for steel plants).....                            | 29.00            |
| Railroad malleable (for malleable works)....                          | 34.00            |
| Wrought iron and soft steel pipes and tubes (new specifications)..... | 33.00            |
| Ungraded pipe .....   | 29.00            |

**Finished Iron and Steel.**—Some of the steel companies in eastern Pennsylvania have received instructions from the Steel Section, War Industries Board, to ship only on A priorities. This notification, it is believed, is the result of rather heavy shipments from these mills on B ratings. Chief pressure from Washington is now for plates, shell steel and rails. Jobbers are getting very little steel on their B-4 classification. Many consumers on essential work are finding their regular sources of supply closed to them because their rating is not high enough, and when they attempt to get their orders filled at other mills, they meet with little or no encouragement. The policy of practically all steel companies is not to consider business from consumers who were not their customers in normal times unless a Government allocation order is received. A western Pennsylvania wire mill has received, through its office here, an order for barbed

wire, plain wire and wire rods for shipment to France. Shipments of wire rods for drawing into wire in France have been going forward for some time. The plain wire now ordered is to be barbed in French mills. We quote plates at 3.48c.; plain structural material, 3.23c.; soft steel bars, 3.13c.; bar iron, 3.73c.; No. 10 blue annealed sheets, 4.48c.; No. 28 black sheets, 5.23c., and No. 28 galvanized sheets, 6.48c., all Philadelphia.

## St. Louis

ST. LOUIS, Mo., Oct. 7.

**Pig Iron.**—The pig iron situation has definitely settled down into a complete case of taking material on priority orders for Government work, with no surplus save an occasional odd lot, for domestic production. The recent fixing of a higher price for pig iron has therefore no immediate bearing on the situation here, as consumers at all times are ready to take whatever iron they can get. Furnace representatives' efforts are confined to looking after the movement of material from the furnaces they represent to customers in the St. Louis district and attending to traffic detail and other matters of similar import. During the past week and for the coming two weeks, much of their selling ability is being directed to disposing of Liberty bonds in the current campaign.

**Old Material.**—As a result of peace talk and other developments, a considerable number of the smaller and weaker dealers began during the week to cash in on material held or under contract to them, while the larger dealers readily took the scrap in at prices slightly under the Government figures. The result was that a considerable tonnage changed hands, with a softening of the market, which, however, is not quotably lower. Consumers are taking freely all material available and would take more than is now offered if it could be had. The need for scrap is well maintained in the large plants, particularly because of the immediate needs for war production. The railroads are still shipping heavily to the Pacific Coast, especially of cast scrap, and the lists which are usually out early in the month have been delayed in consequence. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

### Per Gross Ton

|   |                    |
|---|--------------------|
| Old iron rails.....   | \$38.50 to \$39.00 |
| Old steel rails, rerolling.....                               | 33.50 to 34.00     |
| Old steel rails, less than 3 ft.....                          | 31.00 to 31.50     |
| Relaying rails, standard sections, subject to inspection..... | 65.00 to 65.00     |
| Old carwheels .....   | 28.50 to 29.00     |
| No. 1 railroad heavy melting steel scrap .....                | 28.50 to 29.00     |
| Heavy shoveling steel.....                                    | 28.00 to 28.50     |
| Ordinary shoveling steel .....                                | 27.00 to 27.50     |
| Frogs, switches and guards, cut apart .....                   | 28.50 to 29.00     |
| Ordinary bundled sheet scrap.....                             | 24.75 to 25.25     |
| Heavy axle and tire turnings.....                             | 21.50 to 22.00     |

### Per Net Ton

|  |                    |
|--|--------------------|
| Iron angle bars.....                                   | \$33.00 to \$33.50 |
| Steel angle bars.....                                  | 29.50 to 30.00     |
| Iron car axles.....                                    | 41.00 to 41.50     |
| Steel car axles.....                                   | 41.00 to 41.50     |
| Wrought arch bars and transoms.....                    | 40.00 to 40.50     |
| No. 1 railroad wrought.....                            | 29.75 to 30.25     |
| No. 2 railroad wrought.....                            | 29.00 to 29.50     |
| Railroad springs .....                                 | 29.75 to 30.25     |
| Steel couplers and knuckles.....                       | 29.75 to 30.25     |
| Locomotive tires, 42 in. and over, smooth inside ..... | 38.50 to 39.00     |
| No. 1 dealers' forge.....                              | 26.00 to 26.50     |
| Cast iron borings.....                                 | 16.50 to 17.00     |
| No. 1 busheling.....                                   | 27.00 to 27.50     |
| No. 1 boilers cut to sheets and rings.....             | 24.00 to 24.50     |
| No. 1 cast scrap.....                                  | 29.50 to 30.25     |
| Stove plate and light cast scrap.....                  | 23.00 to 23.50     |
| Railroad malleable .....                               | 28.75 to 29.25     |
| Agricultural malleable .....                           | 26.75 to 27.50     |
| Pipes and flues .....                                  | 25.25 to 25.75     |
| Heavy railroad sheet and tank scrap.....               | 24.00 to 24.50     |
| Railroad grate bars .....                              | 21.50 to 22.00     |
| Machine shop trimmings .....                           | 16.50 to 17.00     |
| Country mixed scrap .....                              | 21.50 to 22.00     |
| Uncut railroad mixed scrap.....                        | 24.00 to 24.50     |
| Horseshoes .....                                       | 29.00 to 29.50     |

**Coke.**—Coke is being delivered on existing contracts and allotments and no new business is appearing in

either bee-hive or by-product plant output. No recent offerings have been made and none are expected, distribution in this as in pig iron being on the basis of Government allocation.

**Finished Iron and Steel.**—Finished products are moving about as they have been for the past several months with no new features to distinguish the past week from those preceding it. Stock out of warehouse is moving up to capacity, under censorship, and supplies are low at all times, with delays in delivery in consequence. For stock out of warehouse we quote as follows: Soft steel bars, 4.24c.; iron bars, 4.24c.; structural material, 4.34c.; tank plates, 4.59c.; No. 8 sheets, 5.54c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.59c.; No. 28 galvanized sheets, black sheet gage, 7.84c.

## Birmingham

BIRMINGHAM, ALA., Oct. 7.

**Pig Iron.**—There were few foundry allocations during the past week in the Birmingham district and an inquiry for 4,000 tons of basic has not been allotted. The Government's hold on metal is becoming stronger all the time. This week the furnace operators mailed out to all customers a pledge which they must sign before they receive iron, the pledge being that the metal sought is for war purposes exclusively. Non-essentials have quit asking for iron. Stovemakers are making an effort to have their classification raised and also have a weather eye on direct war work. The war work consumers inquire for metal with increasing persistency and in larger volume and will easily preempt all the output. No furnaces have stocks on hand worth the mention. Most of them are shipping the entire daily make and yard accumulations in addition, incident to good car service. Stocks may as well be considered as non-existent, so near do they approach that stage. Fewer furnaces are in blast by two than last month. The Alabama Co. has blown out a Gadsden stack for relining and will have but two active stacks until December. The Woodward Iron Co. has blown out a Vanderbilt stack for relining and one stack of the Tennessee Company at Ensley has gone out. There are now 30 active stacks, of which 12 are on basic, namely 7 of the Tennessee, one each of the Alabama, Gulf States Steel and Sloss-Sheffield and two of the Woodward. The status of foundry metal under these conditions and with empty yards is easily estimated. The Talladega rehabilitated stack has been operating for several weeks in a small way, the output having been around 60 to 80 tons per diem and there are about 1,200 tons on the yards awaiting permission from the Government for shipment to Japan, or, in lieu of that permission, for use in this country. The furnace is financed by the Uraga Dock Yards Co., of Tokio. The one active stack of the Sheffield Iron Corporation at Sheffield has had much trouble, having been down several times since beginning operations in July. The resumption of long-idle stacks has not added to the state's output, because the labor and materials used in them have been just that much taken from an already scant supply. Coal production continues at the new minimum and there is little or no use in speculating on an increase. There are practically no charcoal iron accumulations.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

|                             |         |
|-----------------------------|---------|
| No. 2 foundry and soft..... | \$34.00 |
| Basic .....                 | 33.00   |

**Cast Iron Pipe.**—Operators of sanitary pipe shops make the statement that, were they allowed the pig iron for that purpose, they could operate at maximum on pipe for the building trades, on account of the depleted stocks in warehouses following the uses of the trade since such manufacture stopped. They keep about 50 per cent active on pipe for cantonments and a good deal of war work casting is also done. Water pipe concerns are also fairly busy on cantonment, industrial pipe and castings.

**Coal and Coke.**—Coal output for the week dropped to another minimum of 383,000 tons, slightly less than

during the preceding week. The maximum of 433,000 tons in July has been gradually receded from and there is no reliable indication of increased pace since the new draft. Coke is a hand to mouth affair. The furnace demand is seriously handicapping the foundry trade.

**Old Material.**—A fair volume of scrap is moving from local yards to local consumers, who continue to secure the larger portion of supplies under the maximum owing to the differentials in freight. Under the delivered price, the dealer makes more money by selling to nearby concerns at less than he would by selling to far-off consumers at more. Thus trade for the time being has a well-defined circle drawn about it under these peculiar conditions. We quote per gross ton delivered in Birmingham district on a basis of 85c freight rate as follows:

|                             |                    |
|-----------------------------|--------------------|
| Old steel axles .....       | \$37.00 to \$40.00 |
| Old steel rails.....        | 28.00 to 30.00     |
| Heavy melting steel.....    | 27.00 to 27.50     |
| No. 1 railroad wrought..... | 30.00 to 33.00     |
| No. 1 cast .....            | 30.00 to 31.00     |
| Old carwheels .....         | 30.00 to 31.00     |
| Tramcar wheels .....        | 28.00 to 29.00     |
| Machine shop turnings.....  | 17.00 to 18.00     |
| Cast-iron borings .....     | 17.00 to 18.00     |
| Stove plate .....           | 25.00 to 26.00     |

Small consumers in the Birmingham district and adjacent territory are paying maximum Government prices for cast scrap, viz., \$29 in unbroken lots and as high as \$34.00 in cupola sizes of 150 lb. maximum delivered.

## Buffalo

BUFFALO, Oct. 7.

**Pig Iron.**—The slight increase in prices of the various grades of iron established by the Government as announced last week has no discernible effect on the demand, the Government being the chief customer with increasing requirements for war purposes, and furnace capacity output is not equal to the calls made upon it, notwithstanding some little improvement in total output is reported. Increasing and in fact inordinate demand is noted for malleable, which is unusually scarce at present. Short stocks of low phosphorus ores at furnaces and poor quality of the coke which has been coming in from ovens of late appear to have kept malleable production under normal in tonnage. It is stated Government authorities are asking for reports from furnaces as to the extreme amount of malleable that can be produced between now and spring to go into war work. All furnaces are trying to take as much of Government allocation, of all grades desired, as is practicable. Nothing is booked except through allocation, and every ton of product is handled in that way. Fairly large tonnages have been distributed to district furnaces during the week. The revised price for Lake Superior charcoal is \$38.50 Buffalo for regular grades. We quote the new schedule of prices recently established by the Government, as follows, f.o.b. furnace, Buffalo:

|  |         |
|--|---------|
| No. 1 foundry, 2.75 to 3.25 silicon.....                     | \$37.00 |
| No. 2 X, 2.25 to 2.75 silicon.....                           | 35.25   |
| No. 3 foundry, 1.75 to 2.25 silicon.....                     | 34.00   |
| Gray forge .....   | 33.00   |
| Malleable, silicon not over 2.25.....                        | 34.50   |
| Basic .....  | 33.00   |
| Bessemer .....   | 35.20   |
| Lake Superior charcoal, regular grades, f.o.b. Buffalo ..... | 38.50   |

**Finished Iron and Steel.**—The situation on steel products seems to be growing more tense and mills are shipping practically nothing in priorities lower than B1. Jobbers report stocks almost entirely denuded of nails and wire products of all kinds. It is stated that wire mills are far behind in production and on shipment of quotas of barbed wire desired by the Government; that approximately 100,000 tons are still due on allocations placed. Very little tonnage in the line of hot rolled material is moving except "odds and ends," aside from the quantities for Government use. Considerable sales of bar iron were made the past month, the scarcity of steel bars forcing users to substitute iron. In cold rolled steel products very little material is being shipped on other than A priorities. This applies especially to sizes larger than 2 in. in diameter. It is understood that many mills making cold finished steel are rolling



less than 50 per cent of their capacity, due to their inability to secure hot rolled bars, Government requirements taking up such a large proportion of hot rolled production. All shipments to Canada have been practically stopped pending negotiations between the War Trade Board at Ottawa and the Priority Committee at Washington, except as regards material that has been allocated for the filling of direct war contracts and to apply on the few priority certificates that have recently been negotiated through the War Trade Board, Ottawa, and the War Industries Board, Washington.

**Old Material.**—Heavy demand continues for all lines of scrap materials and lacks so much of full satisfaction that the cheaper commodities and grades are being sought out for such uses as are possible in lieu of better grades and prices of the cheaper grades are rising to a higher comparative level in consequence. There is a feeling in some quarters that many dealers are not endeavoring to give the sub-committee of the American Iron and Steel Institute the support they should in the action taken in the matter of price increase on turnings and that criticisms made by some dealers have not been warranted. Consumers, generally speaking, are well satisfied with the sub-committee's rulings and are looking out to see that no infractions of such rulings are made by dealers. The new prices prevailing for machine shop turnings are \$18 to \$18.50; for stove plate \$28.50 to \$29, and for bundled sheet stamping scrap \$25 to \$26. No. 2 busheling scrap is not being traded in and is eliminated from the price schedule. We quote the present schedule as follows, per gross ton f.o.b. Buffalo:

|  |                  |
|--|------------------|
| Heavy melting steel                        | \$29 00          |
| No. 1 low phosphorus heavy, 0.04 and under | 39 00            |
| Low phosphorus, 0.04 and under             | 36 50            |
| Low phosphorus, not guaranteed             | 34 00            |
| No. 1 railroad wrought                     | 34 00            |
| No. 1 railroad and machinery cast          | 34 00            |
| Iron axles                                 | \$44.00 to 46.00 |
| Steel axles                                | 44.00 to 46.00   |
| Carwheels                                  | 29 00            |
| Railroad malleable                         | 34 00            |
| Machine shop turnings                      | 18.00 to 18.50   |
| Heavy axle turnings                        | 24 00            |
| Clean cast borings                         | 18.00 to 19 00   |
| Iron rails                                 | 36.00 to 37 00   |
| Locomotive grate bars                      | 27.50 to 28 00   |
| Stove plate                                | 28 50 to 29 00   |
| Wrought pipe                               | 27.00 to 28 00   |
| No. 1 busheling scrap                      | 29.00 to 30 00   |
| Bundled sheet stamping scrap               | 25.00 to 26 00   |

## New York

NEW YORK, Oct. 9.

**Pig Iron.**—Some melters of pig iron have expressed surprise that they are compelled to pay as high prices as now prevail under the new schedule. A few had gotten the impression that the advance would be only \$1 per ton on basic and foundry grades and had not taken into consideration the results due to the establishment of the two basing points, Pittsburgh and Birmingham. It has been expected that the Director of Steel Supply would be subjected to some criticism on the ground that his only interest would be to get iron to consumers, but there seems to be very little tendency to criticize anybody. In fact, prices nowadays are not the paramount consideration, as almost the only question is where to obtain the pig iron and have it delivered. We quote prices as follows: for tidewater delivery for Northern and Southern grades up to Jan. 1, 1918:

|  |         |
|--|---------|
| No. 1 X, silicon, 2.75 to 3.25         | \$40.90 |
| No. 2 X, silicon, 2.25 to 2.75         | 39.15   |
| No. 2 plain, silicon, 1.75 to 2.25     | 37.90   |
| No. 2 X Virginia silicon, 2.25 to 2.75 | 42.95   |
| No. 1 Southern (all rail)              | 43.20   |
| No. 2 Southern (all rail)              | 41.70   |

**Ferroalloys.**—In both ferromanganese and spiegel-eisen the week has been devoid of market activity. The September statistics draw attention again to the success of the effort to increase domestic production. The total of ferromanganese and spiegeleisen output last month was 66,275 tons, of which about 39,500 tons was spiegeleisen. This is a remarkable record, representing

a 12,000-ton increase for the two manganese alloys over the previous high record of 54,600 tons in May of this year. It is likely that later months will show some falling off, as the ferromanganese situation is now thought sufficiently assured to permit of turning some of the capacity now engaged on that metal to the production of much needed pig iron. The increased supply of manganese is indicated in reports, not in definite terms, of some offers at a concession from the \$250 quotation for 70 per cent ferromanganese. The quotation on 16 to 18 per cent spiegeleisen remains at \$75, furnace, and on 18 to 20 per cent, at \$82, furnace. Increase in the production of electric ferromanganese by the Anaconda Copper Mining Co. is expected to be gradual. From the single unit now in operation at the Great Falls, Montana, plant, out of the five which will eventually be running there about 150 tons was produced in September, and this will be increased considerably this month. By early 1919 output will probably reach 2000 tons a month or more. Ferrosilicon output increased somewhat in September. We quote \$150 to \$155 for contract 50 per cent ferrosilicon.

**Old Material.**—Rolling mills working on Government business are now well supplied with borings at the \$21 price which they have been permitted to pay, but are still taking some turnings at that quotation. The demand for all kinds of scrap is strong and few, if any, users have been able to buy enough to lay up stores against unfavorable conditions which may come during the winter. We quote buying prices of dealers and brokers per gross ton, New York, as follows:

|  |                  |
|--|------------------|
| Heavy melting steel  | \$26.13          |
| Rerolling rails  | 30.80            |
| Relaying rails   | \$60.00 to 70.00 |
| Iron and steel car axles   | 42.40            |
| No. 1 railroad wrought   | 30.90            |
| No. 1 railroad wrought, cut to not less than 10 in. or over 24 in. | 35.90            |
| Wrought-iron track scrap   | 24.80            |
| Forge fire   | 25.00 to 26.00   |
| No. 1 yard wrought, long   | 29.90            |
| Light iron   | 10.00 to 11.00   |
| Cast borings (clean)   | 16.85            |
| Machine-shop turnings  | 16.85            |
| Mixed borings and turnings   | 16.85            |
| Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long | 29.90            |
| Stove plate  | 26.13            |
| Locomotive grate bars  | 26.13            |
| Malleable cast (railroad)  | 31.12            |
| Old carwheels  | 26.12            |

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

|   |         |
|---|---------|
| No. 1 machinery cast  | \$34.00 |
| No. 1 heavy cast (columns, buildings, materials, etc.), cupola size | 34.00   |
| No. 1 heavy cast, not cupola size                                   | 29.00   |
| No. 1 cast (radiators, cast boilers, etc.)                          | 29.00   |

**Cast-Iron Pipe.**—Cast-iron pipe manufacturers are somewhat perturbed on account of the attitude of officials at Washington in regard to allowing the plants to obtain the necessary pig iron to operate throughout the winter, but it is hoped that the newly created committee of cast-iron pipe manufacturers which will co-operate with the War Industries Board will be able to figure out a satisfactory basis of operations so that no plants will be compelled to suspend. The market is very quiet at the present time. Government prices are \$67.70, New York, for 6-in. and heavier; \$70.70 for 4-in.; \$77.70 for 3-in., and \$1 additional for class A and gas pipe.

**Finished Iron and Steel.**—An urgent demand for 40,315 cars, largely of the 30-ton class and requiring upward of 350,000 tons of steel, is now before the car builders for use in France. It may be recalled that in THE IRON AGE of June 20 it was stated that General Pershing had asked for many thousands of cars. Recently there was a distribution of 20,000 cars and the present inquiry may be taken as covering the remainder. Certain it is that the delivery of cars for home use will be delayed in pushing the rolling stock for the American Expeditionary Forces, but those acquainted with traffic conditions do not look for a recurrence of all the railroad troubles of last winter in spite of the small addition of railroad equipment to take care of the large needs, not to mention the replacement of worn-out railroad property. Up to the present time the

railroads seem to be in position to accept all freight for which permits are granted, and the general control of traffic is calculated to prevent the chaos which marked the situation last winter. Meanwhile, no reservoir is being collected at the Atlantic coast for the shipment of war material to France, vessel space being apparently fully equal to what is reaching seaboard, but there is some backing up at seaports of non-war material, such as shipments to South American countries. It is stated that one of the main trunk lines will have locomotives under white lead at the opening of the winter, so well is it equipped for the winter emergency. The new procedure to facilitate export business in iron and steel, referred to in this column two weeks ago, has now been perfected and is referred to elsewhere in this issue. Hereafter an export license from the War Trade Board will be tantamount to the availability of the material for such business. Little work is appearing in structural lines. The Pennsylvania Railroad is asking for bids on 500 tons of additional bridge and signal tower and ash-handling work, and the Public Service Commission of New York is asking for figures on the remodeling of an inspection shed at 148th Street, involving the handling of 300 tons of material, of which about 50 tons represents new steel. The Pittsburgh-Des Moines Steel Co. has been awarded the 400 tons for the machine shop addition at the Mare Island Navy Yard. We quote mill shipments as follows: Steel bars, 3.145c.; shapes, 3.245c.; plates, 3.495c., and bar iron, 3.745c., all New York. Out-of-store prices are 1c. higher.

## British Steel Market

### Orders Controlling Steel and Cast-Iron Scrap— Coal Scarcity a National Problem

(By Mail)

LONDON, ENGLAND, Sept. 16.—The chief anxiety is the fuel and labor shortage. The insufficient coal supply having become a national problem, with urgent requests from France for supplies, the Premier has made a strong appeal to the miners, incidentally telling them that he has heard of blast furnaces idle for lack of coal. While works find it difficult to keep going with the inadequate supply of coke, there is also the price to be considered as, pending a readjustment, it remains at the maximum figure of 33s. 6d. a ton for good medium furnace Cleveland coke delivered at the works. The Midland pig-iron makers have been informed by the Iron and Steel Controller that if they can supply the Munitions Ministry with foundry iron as low in phosphorus as 1 per cent they may add 5s. per ton to the selling maximum, and for a lower sulphur content than there is at present in forge and foundry they may add 2s. 6d. additional.

The demand for Cleveland foundry pig iron is in excess of the supply, and therefore deliveries are behind. Owing to the fuel difficulty, some furnaces have been on slack blast, resulting in a disproportionate output of the lower qualities. In other directions, and this has been seen particularly where the standard quality is chiefly concerned, the deficiency of labor retards loading. In spite of these difficulties, however, most Class A consumers are becoming better satisfied, and while foundry iron is dealt with on the basis of the current month's needs, there is an active demand for forge iron for forward delivery. It seems to be generally understood that an increased subsidy to iron-makers will be set against the higher cost of fuel, for any advance in price would be troublesome through being retrospective. The price of Cleveland No. 1 is 99s., and for Cleveland G. M. B. No. 4 foundry and No. 4 forge is 95s. For export, No. 1 is 124s. per ton and the other qualities 119s.

The home demand for ferromanganese is maintained, but exports are restricted. The official price of £26 10s. rules for domestic business for 80 per cent material delivered, while terms for Continental ports are £55 to £60 f.o.b. for loose and an additional £2 for

packed. Some small orders have been booked for Canada at \$260 to \$265 c.i.f.

Apart from the heavy allocations for war work, very little business is recorded in semi-finished steel, and the general trade is kept under strict control.

Prices are firm in finished steel, a large amount of shipbuilding material having been turned out. The active demand for all classes of manufactured steel continues, and urgent requirements are more readily met by iron bar makers. The requirements of the shipyards have now been met so well that other work can claim attention.

The Minister of Munitions has issued an order, dated Aug. 20, providing that every person owning iron or steel scrap (whether metal, machinery, plant or structural steel or iron work) shall sell and transfer such scrap whenever required by the Controller, and that the Controller's decision as to what is scrap shall be final. The order further provides that if any such requirement to sell is not complied with within 30 days the Controller may sell or transfer the scrap, the owners in that event receiving the price realized, less cost of sale.

The same authority has also issued an order, dated Aug. 20, controlling cast-iron scrap and making an addition to the General Permit, dated Nov. 1, 1916, fixing maximum prices for various grades of that material as follows:

|   | f | s. | d. |
|---|---|----|----|
| Heavy ordinary cast-iron scrap broken into pieces over 1½ cwt. each, but not exceeding 10 cwt. each.  | 4 | 15 | 0  |
| Heavy machinery cast-iron scrap broken into pieces over 1½ cwt. each, but not exceeding 10 cwt. each. | 5 | 0  | 0  |
| Cold blast cast-iron scrap broken into pieces over 1½ cwt. each but not exceeding 10 cwt. each.       | 6 | 15 | 0  |
| Ingot mold scrap, unbroken.   | 6 | 0  | 0  |
| Ingot mold scrap, broken into pieces over 5 cwt., but not exceeding 2 tons each.                      | 8 | 5  | 0  |
| Ingot mold scrap, broken into pieces over 1½ cwt. each but not exceeding 5 cwt. each.                 | 6 | 10 | 0  |
| Extra for breaking any of the above into pieces not exceeding 1½ cwt. each.                           | 5 | 0  | 0  |
| Cast-iron railway chairs, whole or broken, sold for re-melting.                                       | 5 | 0  | 0  |
| Heavy cast-iron lumps, not exceeding 2 tons each.   | 4 | 12 | 6  |
| Light cast-iron scrap.  | 4 | 5  | 0  |
| Burnt cast-iron scrap, broken ready for cupola.   | 3 | 10 | 0  |
| Burnt cast-iron fire bars.  | 4 | 0  | 0  |
| Cast-iron turnings and borings sold for use in the manufacture of iron and steel.                     | 3 | 5  | 0  |

To all the above prices for cast-iron scrap a sum not exceeding 2½ per cent on such prices may be added in the case of sales by recognized scrap merchants.

## Cleveland

CLEVELAND, Oct. 8.

**Iron Ore.**—Ore shipments, which reached a high peak in July, again fell off in September, amounting to 8,995,014 gross tons during that month as compared with 9,725,331 tons in August and 9,536,152 tons during September, 1917. Shipments, however, still keep ahead of a year ago, the movement from the Lake Superior district until Oct. 1 being 48,321,278 tons as compared with 46,059,706 tons up to Oct. 1, 1917. A year ago about all the vessel capacity was being used to carry ore, as it was desired to bring down as much as possible during the latter part of the season. This year the early season movement was heavier and a great deal of vessel tonnage has been diverted to the grain trade during the past few weeks. Although all of the ore that has been sold will not be brought down the Lakes this season, the Mobilization Committee that is handling the bulk freight movement on the Lakes will see to it that all the expected requirements of the blast furnaces are supplied. The establishment of a basic 8-hr. day by the United States Steel Corporation will apparently have little effect upon the iron ore mining districts, as the mines have been quite generally on an 8-hr. day basis during the past two years. We quote f.o.b. Cleveland, for shipment during the last quarter, as follows:

Old range Bessemer, \$6.65; old range non-Bessemer, \$5.96; Mesaba Bessemer, \$6.40; Mesaba non-Bessemer, \$5.75.

**Pig Iron.**—Better distribution of pig iron to consumers under the plan of sending monthly questionnaires



by the producers to their trade is expected with the tabulation of the returns that are coming in for Oct. 1, being due not later than Oct. 10. This monthly survey was inaugurated in September and is now in better working shape than a month ago and is expected to supply the producers with information so that iron can be shipped to all users that actually need it and to relieve some of the strain caused by the insistent demand for pig iron both by consumers whose supplies are about exhausted and by those that still have stocks. If a consumer's report indicates that he has enough iron in his yard to keep his plant operating for a reasonable length of time he will have to wait for further shipments until some foundry that is in more urgent need of iron is supplied. Allocations of pig iron by the Pig Iron Committee to supply Government demands showed a decided increase during the week, amounting to 82,600 tons. For several weeks the allocations have not exceeded about 50,000 tons. Of the total allocated nearly one-half, or 36,000 tons, was for next year's delivery, this being mostly in malleable and low phosphorus grades. Allocations of malleable iron amounted to 18,000 tons. Most of this will go to the Buffalo district for making semi-steel shells. Other allocations are for low phosphorus iron, 26,000 tons; basic iron, 19,000 tons; foundry iron, 17,000 tons; Bessemer, 2250 tons; silvery and Bessemer ferrosilicon, 300 tons. The total allocations from May 1 to date were 1,187,580 tons. Considerable inquiry is coming out for Southern foundry iron for next year's delivery. Producers are not quoting on these inquiries, but are referring the trade to the War Industries Board. We quote, delivered Cleveland, as follows:

|   |         |
|---|---------|
| Bessemer .....                                | \$36.60 |
| Basic .....                                   | 33.40   |
| Northern No. 2 foundry .....                  | 34.40   |
| Southern No. 2 foundry .....                  | 39.00   |
| Gray forge .....                              | 33.40   |
| Ohio silvery, 8 per cent silicon .....        | 49.90   |
| Standard low phosphorus, Valley furnace ..... | 53.00   |

**Coke.**—Some foundries in this territory are running short of coke, this being due in some cases, at least, to the fact that their supply of by-product coke from Ashland, Ky., has been shut off. These consumers have taken the matter up with the Fuel Administrator and a Cleveland by-product plant has been instructed to furnish the coke needed. As this plant is already entirely sold up on its coke output there is a possibility of considerable shortage of foundry coke later and the allocation of coke by the Government may become more general.

**Bolts, Nuts and Rivets.**—The demand for bolts and nuts continues heavy. Among new inquiries is one from the Engineering Department of the Army, which will require a large tonnage. Manufacturers complain of an increasing scarcity of raw material and some Cleveland plants are operating only at about 75 per cent of capacity because of the steel shortage. The demand for rivets is heavy and production is being curtailed by the inability to secure steel. This is said to be especially true of a large plant in the Chicago territory. The largest Cleveland plant is now being operated on double turn, but scarcity of labor has prevented running the plant more than at about 40 per cent capacity at night. It is understood that the order recently placed for rivets for Hog Island was cut down from the original inquiry of 15,000 tons to 8500 tons.

**Finished Iron and Steel.**—The shortage of steel is daily growing more acute. The large shell forge department of the Hydraulic Pressed Steel Co. was completely shut down three days the past week because of its inability to secure bars for 75-mm. shells and is now operating at only two-thirds of capacity. Other plants are suffering from lack of material bearing a high priority rating. It is understood that the Government plans to place 25,000 class B 3-ton trucks for December-June delivery. These will require 22,500 tons of chrome-vanadium spring steel and steel men do not see how this steel can be furnished, as mills are already badly congested with alloy steel orders for truck springs and other purposes. Builders of passenger cars are deeply concerned over securing steel to complete their cars this year for which permits have been given and

are substituting carbon steel for alloy steel for springs. France has placed orders with a Cleveland plant for 150 miles of portable track and 2500 frogs and switches, requiring 6000 tons of light rails which will be supplied by a Chicago district mill. American requirements call for a large quantity of portable track, which is being placed. The Inland Ordnance Co., Bedford, Ohio, has taken another order for 3 and 4-in. guns, which will require 6000 tons of electric low-chrome nickel steel. Allocations in the week include 3000 tons of plates to a Pittsburgh district mill for the American Shipbuilding Co. and 400 tons of bars for machine gun tripods. One leading producer is notifying its trade that because of the high sulphur content in coke its steel is running high in sulphur and it is necessary to insist that steel be accepted that analyzes 0.06 per cent sulphur. Some consumers are objecting. The demand for shell steel discard is in excess of the supply and a Cleveland mill is selling this at the Government price and in some cases charging the usual extras. There is a heavy demand for this steel from the implement trade and it is being largely supplied to jobbers as a substitute for soft steel in bars and structural material. The price concession on steel bars to the implement trade may compel that trade to depend almost wholly on soft steel bars. Makers of hard steel bars believe they can keep their plants filled up with other than implement orders, and as long as they can do so they will look for other channels for their output at the regular price. Price concessions to the implement trade do not affect cut shapes, plates or slabs. The demand for sheets is very active and includes orders for several thousand tons placed for gas containers to be made by steel barrel manufacturers. One leading Valley sheet mill is now restricting its orders to class A material, thus cutting off jobbers as well as others in class B.

Steel bars, 4.07c.; plates, 4.42c.; structural material, 4.17c.; No. 10 blue annealed sheets, 5.42c.; No. 28 black sheets, 6.42c.; No. 28 galvanized sheets, 7.67c.

**Old Material.**—The trade as a whole does not agree with opinions expressed by some dealers that there is sufficient scrap to supply all the needs. Some of the dealers say that they are in the market for round tonnages which they are unable to buy and that some of the steel plants are short of scrap and are taking inferior grades of material because of inability to secure what they want. The demand is good for all grades. Heavy turnings are very scarce and steel plants are scouring the market for this material. Borings do not appear to be quite as active as they have been and there is not much call for busheling. Cupola cast scrap is in good demand and the supply is not plentiful. Prices are firm at the Government maximum on most regulated grades. Stove plate and railroad grate bars have been marked up slightly. We quote delivered, consumers' yards in Cleveland and vicinity as follows:

| Per Gross Ton                                |                    |
|--|--------------------|
| Steel rails .....                            | \$28.00 to \$29.00 |
| Steel rails, under 3 ft. ....                | 34.00              |
| Steel rails, rerolling .....                 | 34.00              |
| Iron rails .....                             | 39.00              |
| Iron car axles .....                         | 46.50              |
| Steel car axles .....                        | 46.50              |
| Heavy melting steel .....                    | 29.00              |
| Cast borings .....                           | 19.00              |
| Iron and steel turnings and drillings .....  | 19.00              |
| Hydraulic compressed sheet scrap .....       | 28.00 to 29.00     |
| No. 1 railroad wrought .....                 | 34.00              |
| Cast-iron carwheels, unbroken .....          | 29.00              |
| Cast-iron carwheels, broken .....            | 34.00              |
| Agricultural malleable .....                 | 29.00 to 30.00     |
| Railroad malleable .....                     | 34.00              |
| Steel axle turnings .....                    | 24.00              |
| Light bundled sheet scrap .....              | 24.50 to 25.00     |
| Cast-iron scrap .....                        | 29.00              |
| Cast-iron scrap, broken to cupola size ..... | 34.00              |
| No. 1 busheling .....                        | 30.00 to 31.00     |
| Per Net Ton                                  |                    |
| Railroad grate bars .....                    | \$25.00 to \$25.50 |
| Stove plate .....                            | 25.00 to 25.50     |

The scarcity of cast-iron pipe and its increase in value in Southern California is shown by the proposed sale of pipe by the city of San Diego. The city has a quantity of 30-in. pipe on hand which has never been used, and which was purchased in 1912 at \$27.50 per ton. An offer of \$68 per ton has been made by the Western Sugar Co.



## Cincinnati

CINCINNATI, Oct. 8—(By Wire).

**Pig Iron.**—The allocation program has not been worked out to a point where it is satisfactory to either the furnaces or the melters. For this reason, there is very little contracting ahead, as past experience has apparently convinced both sides that a contract for future shipment is subject to change from Washington. Considerable complaint is made as to the diverting of shipments from one industry to another. With the exception of the stove makers, every melter in this vicinity is practically on the essential list and there is no metal now going to any firm that cannot show it is operating on essential work. The sale of Southern off iron is slowing down because nearly all of the available tonnage in the South has been disposed of. Melters are not very particular now about what kind of iron they buy and it is simply a question of being able to get the metal. The organization of the Southern Ohio Pig Iron Association may tend to promote production in that district although practically all of the furnaces in the Hanging Rock district are working at full capacity. Seldom in the history of the business have the foundries and rolling mills put off buying for the coming year's requirements as long as they have this year. Ordinarily many consumers buy iron for delivery 12 months ahead at this season of the year, but some of these same melters have now only a sufficient supply to carry them through the remainder of the quarter.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote, f.o.b. Cincinnati:

|   |         |
|---|---------|
| Southern coke, No. 2 foundry and No. 2 soft | \$37.60 |
| Southern Ohio, No. 2                        | 35.80   |
| Basic, Northern                             | 34.80   |

**Finished Material.**—In a few instances, local jobbers have been able to pick up odd lots of different kinds of finished material from the mills, but probably one-half of this is not standard. However, almost anything in the metal line now is saleable. In spite of the building restrictions, there is a good demand for reinforcing concrete bars, which are mainly for additions to plants that are engaged in urgent essential work. Cold-rolled shafting is also needed urgently, and customers' needs very much exceed the available supply in local warehouses. Mill shipments to jobbers are still very slow, as the bulk of the material is going directly to firms having war contracts, or to the Government itself. Galvanized sheets can not be obtained by sheet metal contractors unless they are engaged in what is considered strictly Government work. As a consequence, a number of the smaller contractors are practically idle because they cannot obtain the material for carrying on their work. The air nitrate plant now under construction at Ancor, a suburb, is drawing heavily on all kinds of stocks that will be difficult for the jobbers to replenish unless some special provision is made to furnish them material for this purpose. No barbed wire is in stock and the total quantity of wire nails held locally is at a low water mark. No changes in store prices affecting articles quoted resulted from the meeting of September 25.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.23c., and wire nails, \$4.50 per keg base.

**High Speed Steel.**—Shipments on some standard sizes are not going forward as rapidly as customers desire, but taking the situation as a whole it is not an unsatisfactory one. Practically every user of high speed steel to-day is engaged in essential work, and for this reason the makers are doing all in their power to fill their customers' requirements as quickly as possible. The leading makers are adhering firmly to the Government's price of \$2 per lb., and rumors that any reductions have been made appear to be without foundation, as far as this territory is concerned.

**Coke.**—Reports from the furnaces in southern Ohio show that they are receiving a supply sufficient for all of their needs, and in some instances they have been

able to stock up against any possible traffic interruptions this winter. The Southern furnaces also appear to be getting a supply of better coke and taking everything into consideration, the situation is more encouraging and it is very different from the one existing six months ago. Should the oven operators be able to keep up their present output, the winter season will be passed without any appreciable hardships, as far as the furnaces are concerned. The foundries also report more prompt shipments than heretofore, and only a few of them make any complaints on this score. However, they have not yet been able to pile up any large stocks.

**Old Material.**—There is still a very heavy demand for both No. 1 machine cast and all kinds of steel scrap, and the incoming supply is barely keeping up with outgoing shipments. One significant fact that is brought out by some of the dealers concerns the limited amount of scrap offered by the railroads. Shipments from the smaller dealers in outside territory are also not as heavy as usual at this season of the year. The limited number of melters of borings and turnings that are allowed to pay \$21 per gross ton delivered furnishes one reason why this market has not yet been affected, and as far as is known, no shipments from here have been made on this basis up to the present time. The following are buying market prices, f.o.b. cars Cincinnati and southern Ohio, in carload lots:

| Per Gross Ton                 |                    |
|-------------------------------|--------------------|
| Bundled sheet scrap           | \$21.50 to \$22.50 |
| Old iron rails                | 33.50 to 34.00     |
| Relaying rails, 50 lb. and up | 44.50 to 45.00     |
| Rerolling steel rails         | 31.00 to 32.00     |
| Heavy melting steel scrap     | 27.50 to 28.00     |
| Steel rails for melting       | 27.50 to 28.00     |
| Old carwheels                 | 27.50 to 28.00     |

| Per Net Ton                      |                    |
|----------------------------------|--------------------|
| No. 1 railroad wrought           | \$29.00 to \$29.50 |
| Cast borings                     | 13.00 to 13.50     |
| Steel turnings                   | 14.50 to 15.00     |
| Railroad cast                    | 25.00 to 25.50     |
| No. 1 machinery                  | 28.00 to 28.50     |
| Burnt scrap                      | 17.50 to 18.00     |
| Iron axles                       | 40.00 to 40.50     |
| Locomotive tires (smooth inside) | 35.50 to 36.00     |
| Pipes and flues                  | 21.00 to 21.50     |
| Malleable cast                   | 24.50 to 25.00     |
| Railroad tank and sheet          | 19.00 to 19.50     |

## Meeting of Ornamental Iron and Bronze Manufacturers

War subjects come in for special consideration at the eleventh annual meeting of the National Association of Ornamental Iron and Bronze Manufacturers, to be held Oct. 10 and 11 at the Hotel Iroquois, Buffalo, N. Y. The effect of war conditions on overhead is to be discussed at the Thursday morning session by F. P. Smith, and at the Friday morning session the addresses scheduled include one on "How Shall We Keep Our Factories Busy During the War?" by T. E. Griffith, and "Report and Recommendations as to the Best Manner of Obtaining War Work," by E. F. Lasar.

A dinner is to be tendered on Thursday evening at the Buffalo Automobile Country Club by F. Grimm and the Buffalo Wire Works Co. Charles F. Waltz, 905 First National Bank Building, Cincinnati, is commissioner of the Association.

## Arrested on Charge of Fraud

W. J. Oliver, manufacturer, and 10 other officers and other employees of the W. J. Oliver Mfg. Co., Knoxville, Tenn. were arrested Oct. 4 on charges of conspiracy, fraud and sabotage in the manufacture of defective shells for the United States Army. The plant was seized by Government agents. Mr. Oliver was released on \$25,000 bond; J. Ed Campbell, Thomas P. Roberts and J. S. Waterman, named as officials of the company, on \$10,000 each, and five foremen on \$5,000 each. Denial of the charges has been made by all the accused, and Mr. Oliver is quoted as saying that the charges are the result of spite work growing out of labor troubles.

## IRON AND INDUSTRIAL STOCKS

### Steel Company Common Stocks Show Large Decline as a Result of War Trend

NEW YORK, Oct. 7.

The surrender of Bulgaria, with its possibilities for vitally improving the war outlook for the Allies, caused an effort among traders last week to differentiate between the so-called war stocks and what have become classified as peace shares. Some confusion in the market trend resulted. Many important industrial issues sold at new high prices for the year, but steel company stocks showed a considerable net loss for the week. Bethlehem Steel, com., fell off 8 points, class B, 8%; Colorado Fuel & Iron, com., 2½; Crucible Steel, com., 8¼; Gulf States Steel, com., 7¼; Lackawanna Steel, com., 4½; Midvale Steel, com., 3; Nova Scotia Steel & Coal, com., 2¼; Republic Iron & Steel, com., 2½; Sloss-Sheffield Steel & Iron, com., 5; Superior Steel, com., 2½; United States Steel, com., 4½. Preferred shares were nearly stationary.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| Allis-Chalm. com. 27½-29¼            | Int. Har. Corp. pf. ....106         |
| Allis-Chalm. pf. 81½-83              | Lackaw. Steel ... 75-80¼            |
| Am. Can com. 43-45½                  | Lake Supr. Corp. 16½-18             |
| Am. Can pf. 92-92½                   | Lima Loco. .... 41-44               |
| Am. Car & Fdry. com. 83-86½          | Midvale Steel ... 47¼-50½           |
| Am. Car & Fdry. pf. ....111-111½     | Nat. Acme ..... 30½                 |
| Am. Loco. com. 63-66½                | Nat. Enam. & Stm. com. .... 43¼-49¼ |
| Am. Loco. pf. .... 99½               | N. Y. Air Brake. 112½-117½          |
| Am. Ship com. 133-137                | Nova Scotia Steel. .... 62½         |
| Am. Ship pf. .... 86½-90             | Pressed Stl. com. 68½-69½           |
| Am. Steel Fdries. 82½-87¼            | Pressed Steel pf. 95-96¼            |
| Bald. Loco. com. 80½-88              | Ry. Steel Spring com. .... 65½-68½  |
| Beth. Steel com. 72-75               | Republic com. .... 86-91¼           |
| Bethn. Stl. Cl. B. 72½-75¼           | Republic pf. .... 100¼              |
| Charcoal Iron pf. .... 6½            | Sloss com. .... 54-59               |
| Chic. Pneu. Tool. 68-69              | Sloss pf. .... 90                   |
| Colo Fuel ..... 42½-45               | Superior Steel ... 38½-41¼          |
| Crucible Stl. com. 53-63¼            | Un Alloy Steel. 37-37½              |
| Crucible Steel pf. 89-90             | U. S. Steel com. 106½-110¼          |
| Gen. Electric ... 148½-151½          | U. S. Steel pf. 110¼-110½           |
| Gt. No. Ore Cert. 29½-31¼            | Va. I. C. & Coke. 70-71             |
| Gulf States Steel. 70-76             | Warwick ..... 8¼                    |
| Int. Har. of N. J. com. ....131-134½ | Westingh. Elec. 42½-44              |
| Int. Har. of N. J. pf. ....106       |                                     |

### Dividends

The Harbison-Walker Refractories Co., quarterly, 1½ per cent on the common, payable Oct. 19.

The Midvale Steel & Ordnance Co., quarterly, \$1.50, payable Nov. 1.

The Steel Co. of Canada, quarterly, 1½ per cent on the common, and 1¼ per cent on the preferred, payable Nov. 1.

The Superior Steel Co., quarterly, 1½ per cent on the common and 2 per cent on the first and second preferred, all payable Nov. 1.

The United Alloy Steel Corporation, quarterly, \$1, payable Oct. 19.

The Westinghouse Electric & Mfg. Co., quarterly, 87½c. on the common, payable Oct. 31, and 87½c. on the preferred, payable Oct. 15.

The Westinghouse Air Brake Co., quarterly, \$1.75, payable Oct. 31.

The Carbon Steel Co., quarterly, 2 per cent and extra 3 per cent on the common, payable Oct. 15.

### Industrial Finances

The outstanding 7 per cent second cumulative preferred stock of the Lukens Steel Co. has been called for redemption at 103 and accrued dividends. Holders are privileged to convert their shares into common stock at the rate of two shares of common for one of the second preferred at any time before Oct. 30.

An agreement has been reached between the Midland Shipbuilding Co., Midland, Ont., and the International Brotherhood of Boilermakers and Helpers, under which the men employed by the company receive an increase of 5c. per hr. Under the new scale first-class mechanics will receive 70c. per hr., second-class 60c. and third-class 50c.; helpers according to grade, from 40c. to 50c. per hr.

The Chicago Pneumatic Tool Co., Franklin, Pa., is having plans prepared for the construction of a one-story erecting shop, 50 x 150 ft., to cost \$30,000.

### Keeping the Price Book Up to Date

The reprint of the price changes published in THE IRON AGE of Sept. 26, to be pasted on blank pages of the booklet of the American Iron and Steel Institute, is now ready for mailing and will be sent postpaid at 6c. per copy. The changes announced in to-day's issue of THE IRON AGE will also be included. This latest supplement, known as document E and the preceding supplement, document B, are printed in exactly the same measure of type as the booklet and can be easily pasted in the blank pages. The only way in which the value of the booklet can be maintained is by making the corrections as they are published from time to time.

### New Shell Plants at St. Louis Are Authorized

WASHINGTON, Oct. 8.—The War Department has authorized the erection of two plants for the manufacture of shells in the works of the Laclede Gas Light Co., St. Louis, at an estimated cost of \$3,830,300. It also authorized the building of barracks for workers at the citric acid plant of the Somet-Solvay Co. at Grand Rapids, Mich., at a cost of \$450,000.

### Manganiferous Ore in Oregon

The U. S. Geological Survey in a recent bulletin estimates that the production of manganese ore in the United States in 1918 will be 185,000 gross tons. The bulletin refers particularly to a reconnaissance of 150 square miles near Lake Creek, Ore., in which are a number of manganiferous deposits. The nearest large town to these deposits is Medford, which is 15 miles directly southwest, but nearly twice that distance by available roads. Since October, 1917, the Manganese Metals Co. has explored by open cuts and drill holes three or four acres about five miles southeast of Lake Creek postoffice and has erected a mill capable of treating 20 tons of crude ore in 24 hours. The mill has produced concentrates containing an average of about 45 per cent of manganese, four tons of crude ore yielding one ton of concentrate. The cost of hauling concentrates by teams from the Manganese Metals Co.'s mill to the railroad at Eagle Point is now \$4 a ton. Options on several claims including the larger part of the holdings of the Manganese Metals Co., have been obtained by Victor Rakowsky of Joplin, Mo., whose plans contemplate at least one mill having a daily capacity of 500 tons of crude ore, which is to be in operation before the end of this year. The ore so far mined has averaged about 20 per cent of manganese. Car samples of two shipments of concentrate ran 47.5 and 48.5 per cent of manganese.

### Rule as to Copper Ore Modified

WASHINGTON, Oct. 8.—The ruling of the War Trade Board (No. 211) affecting the importation of copper ore has been so far modified by a new ruling as to permit the importation of copper concentrates containing 50 per cent or over of copper from non-enemy countries, instead of 60 per cent or over, as in the former ruling. The previous restriction prohibiting the importation of ore, except from Cuba, Canada or Mexico and of copper concentrates containing less than 50 per cent of copper, except from the above countries, remains in force. There is no restriction upon the importation from any non-enemy country of copper matte, blister copper, or copper concentrates containing 50 per cent or more of copper.

Dr. Daniel R. Hodgson, director of the Newark Technical School, Newark, N. J., and a committee from the local Foundrymen's Association, are working out a special course in foundry instruction to be given during the present school year. A course in industrial chemistry is also being outlined in co-operation with local chemical interests.

# Prices Finished Iron and Steel, f.o.b. Pittsburgh

An advance in freight rates of 25 per cent from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, went into effect June 25, 1918. The rates from Pittsburgh, in carloads, to points named, per 100 lb. are as follows: New York, 24.5c.; Philadelphia, 23c.; Boston, 27c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

## Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs. ¼ in. thick and over, and zees, structural sizes, 3c.

## Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barbed wire and fence staples, \$4.35; painted barbed wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

## Bolts, Nuts and Rivets

Large structural and ship rivets, \$4.40 base  
Large boiler rivets, \$4.50  
7/16 in. x 6 in. smaller and shorter rivets, 50-10 per cent off list  
Machine bolts h.p. nuts, ¼ in. x 4 in.:  
Smaller and shorter, rolled threads, 50-10-5 per cent off list  
Cut threads, 50-5 per cent off list  
Larger and longer sizes, 40-10 per cent off list  
Machine bolts, c.p.c. and t. nuts, ¼ in. x 4 in.:  
Smaller and shorter, 40-10 per cent off list  
Larger and longer, 35-5 per cent off list  
Carriage bolts, ¾ x 6 in.:  
Smaller and shorter, rolled threads, 50-5 per cent off list  
Cut threads, 40-10-5 per cent off list  
Larger and longer sizes, 40 per cent off list  
Lag bolts, 50-10 per cent off list  
Flow bolts, Nos. 1, 2, 3, 50 per cent off list  
Hot pressed nuts, sq., blank, 2.50c. per lb. off list  
Hot pressed nuts, hex., blank, 2.30c. per lb. off list  
Hot pressed nuts, sq., tapped, 2.30c. per lb. off list  
Hot pressed nuts, hex., tapped, 2.10c. per lb. off list  
C.p.c. and t. sq. and hex. nuts, blank, 2.25c. per lb. off list  
C.p.c. and t. sq. and hex. nuts, tapped, 2.00c. per lb. off list  
Semi-finished hex. nuts:  
¾ in. and larger, 60-10-10 per cent off list  
5/16 in. and smaller, 70-5 per cent off list  
Stove bolts, 70-10 per cent off list  
Stove bolts, 2½ per cent extra for bulk  
Tire bolts, 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

## Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

## Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb. \$1.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.90. Boat spikes, \$5.25 per 100 lb., f.o.b. Pittsburgh

## Terne Plate

Effective May 21 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., \$15 per package; 8-lb. coating, 1 C., \$15.30; 12-lb. coating, 1 C., \$17.00; 15-lb. coating, 1 C., \$18.00; 20-lb. coating, 1 C., \$19.60; 25-lb. coating, 1 C., \$20.60; 30-lb. coating, 1 C., \$21.75; 35-lb. coating, 1 C., \$22.75; 40-lb. coating, 1 C., \$24.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

## Iron and Steel Bars

Steel bars at 2.90c. from mill. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

## Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

| Steel                               |       |       | Iron                                |       |       |
|-------------------------------------|-------|-------|-------------------------------------|-------|-------|
| Inches                              | Black | Galv. | Inches                              | Black | Galv. |
| ¾, 1 and 1½                         | 44    | 17½   | 1½ and 2                            | 23    | +4    |
| 1½ to 2                             | 48    | 33½   | 2 to 2½                             | 24    | +3    |
| 2½ to 3                             | 51    | 37½   | 2½ to 3                             | 28    | 19    |
|                                     |       |       | 3 to 1½                             | 33    | 17    |
| Lap Weld                            |       |       | Lap Weld                            |       |       |
| 2                                   | 44    | 31½   | 1½                                  | 18    | 3     |
| 2½ to 6                             | 47    | 34½   | 1½                                  | 25    | 11    |
| 7 to 12                             | 44    | 30½   | 2                                   | 26    | 12    |
| 13 and 14                           | 34½   |       | 2½ to 6                             | 28    | 15    |
| 15                                  | 32    |       | 7 to 12                             | 25    | 12    |
| Butt Weld, extra strong, plain ends |       |       | Butt Weld, extra strong, plain ends |       |       |
| ¾, 1 and 1½                         | 40    | 22½   | 1½, 2 and 3                         | 22    | 5     |
| 1½ to 2                             | 45    | 32½   | 1½                                  | 27    | 14    |
| 2 to 3                              | 49    | 36½   | ¾ to 1½                             | 33    | 18    |
| 3 to 4                              | 50    | 37½   |                                     |       |       |
| Lap Weld, extra strong, plain ends  |       |       | Lap Weld, extra strong, plain ends  |       |       |
| 2                                   | 42    | 30½   | 1½                                  | 19    | 4     |
| 2½ to 4                             | 45    | 33½   | 1½                                  | 25    | 11    |
| 4½ to 6                             | 44    | 32½   | 2                                   | 27    | 14    |
| 7 to 8                              | 40    | 26½   | 2½ to 4                             | 29    | 17    |
| 9 to 12                             | 35    | 21½   | 4½ to 6                             | 28    | 16    |
|                                     |       |       | 7 to 8                              | 20    | 8     |
|                                     |       |       | 9 to 12                             | 15    | 3     |

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

## Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

| Lap Welded Steel                                      |       | Charcoal Iron   |       |
|---|-------|---|-------|
| 3½ to 4½ in.  | 31    | 3½ to 4½ in.  | 12½   |
| 2½ to 3½ in.  | 24    | 3 to 3½ in.   | +5    |
| 2½ in.  | 17½   | 2½ to 2¾ in.  | +7½   |
| 1½ to 2 in.   | 13    | 2 to 2½ in.   | +22½  |
|   |       | 1½ to 1¾ in.  | +35   |
| Standard Commercial Seamless—Cold Drawn or Hot Rolled |       | Standard Commercial Seamless—Cold Drawn or Hot Rolled |       |
| Per Net Ton   |       | Per Net Ton   |       |
| 1 in.   | \$340 | 1½ in.  | \$220 |
| 1½ in.  | 280   | 2 to 2½ in.   | 190   |
| 1¾ in.  | 270   | 2½ to 3 in.   | 180   |
| 1½ in.  | 220   | 4 in.   | 200   |
|   |       | 4½ to 5 in.   | 220   |

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

## Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows:

| Blue Annealed—Bessemer                      |  | Cents per lb. |      |
|---|--|---------------|------|
| No. 8 and heavier                           |  |               | 4.20 |
| Nos. 9 and 10                               |  |               | 4.25 |
| Nos. 11 and 12                              |  |               | 4.30 |
| Nos. 13 and 14                              |  |               | 4.35 |
| Nos. 15 and 16                              |  |               | 4.45 |
| Box Annealed, One Pass Cold Rolled—Bessemer |  | Cents per lb. |      |
| Nos. 17 to 21                               |  |               | 4.80 |
| Nos. 22 and 23                              |  |               | 4.85 |
| Nos. 25 and 26                              |  |               | 4.90 |
| No. 27                                      |  |               | 4.95 |
| No. 28                                      |  |               | 5.00 |
| No. 29                                      |  |               | 5.10 |
| No. 30                                      |  |               | 5.20 |
| Galvanized Black Sheet Gage—Bessemer        |  | Cents per lb. |      |
| Nos. 10 and 11                              |  |               | 5.25 |
| Nos. 12 and 13                              |  |               | 5.35 |
| Nos. 15 and 16                              |  |               | 5.50 |
| Nos. 17 to 21                               |  |               | 5.65 |
| Nos. 22 and 23                              |  |               | 5.80 |
| Nos. 25 and 26                              |  |               | 5.95 |
| No. 27                                      |  |               | 6.10 |
| No. 28                                      |  |               | 6.25 |
| No. 29                                      |  |               | 6.50 |
| No. 30                                      |  |               | 6.75 |
| Thick Black Plate—Bessemer                  |  | Cents per lb. |      |
| Nos. 17 and 18                              |  |               | 4.80 |
| Nos. 17 to 21                               |  |               | 4.85 |
| Nos. 22 to 23                               |  |               | 4.90 |
| Nos. 25 and 27                              |  |               | 4.95 |
| No. 28                                      |  |               | 5.00 |
| No. 29                                      |  |               | 5.05 |
| No. 30                                      |  |               | 5.05 |
| Nos. 30½ and 31                             |  |               | 5.10 |



## Metal Markets

### The Week's Prices

| Cents Per Pound for Early Delivery |       |               |               |                |           |                   |           |
|------------------------------------|-------|---------------|---------------|----------------|-----------|-------------------|-----------|
| Copper, New York                   |       | Tin, New York |               | Lead, New York |           | Spelter, New York |           |
| Oct.                               | Lake  | Electro-lytic | Tin, New York | New York       | St. Louis | New York          | St. Louis |
| 2.....                             | 26.00 | 26.00         | *82.00        | 8.05           | 7.75      | 9.40              | 9.05      |
| 3.....                             | 26.00 | 26.00         | *82.00        | 8.05           | 7.75      | 9.35              | 9.00      |
| 4.....                             | 26.00 | 26.00         | *82.00        | 8.05           | 7.75      | 9.25              | 8.90      |
| 5.....                             | 26.00 | 26.00         | .....         | 8.05           | 7.75      | 9.20              | 8.85      |
| 7.....                             | 26.00 | 26.00         | *82.00        | 8.05           | 7.75      | 9.20              | 8.85      |
| 8.....                             | 26.00 | 26.00         | *82.00        | 8.05           | 7.75      | 9.20              | 8.85      |

\*Nominal.

NEW YORK, Oct. 9.

The markets all continue quiet, with demand very light. In copper circles interest centers in a possible price change after Nov. 1. Tin buyers continue out of the market. The lead interest is unchanged. Spelter is still quite inactive and a little easier than a week ago. Antimony is steady.

### New York

**Copper.**—Some of those who are students of the price situation contend that there is no reason for an increase after Nov. 1, at which time the present price of 26c. per lb. expires. To back up the contention they cite larger importations of crude copper, an increased output of refined copper very recently, and less exports than up to the same time a year ago. No one looks for any decrease in the price, while there are some who argue for an increase because refining costs are said to have increased since the last price was fixed on Aug. 7, and also because of a 10 per cent advance in wages in September by the mining companies. One authority says that the available supply of metal is about equal to the Allies' and our own war demand. Sales of refined copper for delivery after Nov. 1 are said to have been made subject to the price ruling at that time. The situation as to the output of both crude and refined copper is said to be somewhat improved.

**Tin.**—There has been very little change in the situation except that there is an entire absence of any offerings of Straits or English tin. This may indicate that the regulations of an international character may be in effect. As to this, importers now have no definite information except what has appeared in the public press. A significant statement of this nature appeared last week in a New York paper to the effect that all import licenses were now being granted only to the United States Steel Corporation. There continues to be an absence of definite details as to the future conduct of the market. The price for prompt metal at New York continues nominally unchanged at 82c., New York, with little available. The monthly tin statistics of the New York Metal Exchange show that for September the imports of tin were 5454 tons, of which 3989 tons came in at Pacific ports. In stocks and landing on Sept. 30 there were 275 tons. Imports from Jan. 1 to Oct. 1, 1918, have been 47,428 tons, as against 44,837 tons to Oct. 1, 1917, an increase this year of 2591 tons. There has been a constant increase in the monthly average of tin deliveries. In 1913 they were 3658 tons per month and in 1917 they were 4823 tons, and thus far this year they have been 5298 tons per month.

**Lead.**—There is very little reason for believing that the present fixed prices of lead, 8.05c., New York, or 7.75c., St. Louis, will be changed for some little time. The question is one of output and if full operation can be continued at refineries it is believed that the Lead Producers' Committee, in whose hands the entire situation is as to distribution, can see that all essential needs are supplied. There is no change in fundamental conditions.

**Spelter.**—The market continues to ease and prices

are again lower. Prime Western for October shipment is now quoted at 8.85c., St. Louis, or 9.20c., New York, with prompt delivery held at 8.90c., St. Louis, or 9.25c., New York. These prices are largely nominal, as very little trading is reported and producers are not pressing the market. For November-December delivery the market is about 8.75c., St. Louis, or 9.10c., New York.

**Antimony.**—The market is quiet at about 14c., duty paid, New York, for wholesale lots, and it is possible the price could be shaded.

**Aluminum.**—Government maximum quotations control this market. For No. 1 virgin metal and for scrap they are 33c. per lb. for 50-ton lots, 33.10c. per lb. for 15 to 50 ton lots and 33.20c. per lb. for 1 to 15 ton lots.

**Old Metals.**—The market is quiet. Dealers' selling prices are unchanged as follows:

|  | Cents per lb.  |
|--|----------------|
| Copper, heavy and crucible.....              | 26.00          |
| Copper, heavy and wire.....                  | 25.00          |
| Copper, light and bottoms.....               | 23.00          |
| Brass, heavy.....                            | 17.75          |
| Brass, light.....                            | 19.25          |
| Heavy machine composition.....               | 25.50          |
| No. 1 yellow rod brass turnings.....         | 15.00 to 15.25 |
| No. 1 red brass or composition turnings..... | 23.50          |
| Lead, heavy.....                             | 8.00           |
| Lead, tea.....                               | 6.50           |
| Zinc.....                                    | 7.00           |

### Chicago

Oct. 8.—Copper is pursuing a routine course to a great extent and is being consumed in increasingly large quantities by munitions plants developing in the West. Though some of these are supplied direct by the Government, jobbers have been called upon to make up deficits in shipments from the refineries on Government orders. Tin is in good demand but with no special feature. Lead is extremely active at fixed prices and is only easy to obtain when war needs are to be served. Spelter is weak, with the tendency toward lower prices because of the reduced operations of galvanizers who use prime Western. There is enough antimony to fill all demands; the feeling is better, but the price is unchanged. We quote copper at 26c. for carloads and 27.30c. for part carloads; tin, 85c. to 90c.; lead, nominal at 7.85c. in carloads, 8.35c. per lb. for 1 to 25 tons and 8.60c. per lb. for less than 1 ton; spelter, 9c.; antimony, 15.50c. to 16c. On old metals we quote copper wire, crucible shapes, 22.50c.; copper clips 21.75c.; copper bottoms, 21.50c.; red brass, 22.50c.; yellow brass, 15.50c.; lead pipe, 6.50c.; zinc, 5.75c.; pewter, No. 1, 45c.; tinfoil, 50c.; and block tin, 60c.

### St. Louis

Oct. 7.—Non-ferrous metals continue at about the same level, with lead to-day closing at 7.75c., car lots, and spelter, 9.10c. In less than car lots, lead is 8.25c. for lots of 10 tons and 8.50c. for less than that amount; spelter is 10c.; tin, out of the market; copper, 27.50c.; Asiatic antimony, 18c. In the Joplin district, zinc blend prices showed about the same condition as has prevailed for several weeks, with the top grade ore going in the usual quantity to sheet zinc makers at \$75 per ton and second grades ranging down to \$50 to \$52.50 per ton. The average for the week for the district, basis of 60 per cent metal, was \$55 per ton. Calamine was \$34 to \$40 per ton, basis of 40 per cent metal, with the average for the week for the district \$38 per ton. Lead ore, basis of 80 per cent metal, was \$100 per ton and the average for the week for the district the same figure. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 15c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 22c.; pewter, 50c.; tinfoil, 65c.; lead, 6c.; zinc, 5c.; tea lead, 5c.; aluminum, 20c.

### Applies for Use of Enemy Patent

The Massey Machine Co., Watertown, N. Y., has applied to the Federal Trade Commission for a license to use the patent on "Centrifugal Regulators" issued in 1909 to Wilhelm Jahns, Offenbach-on-the-Main, Germany. The commission is considering the merits of the application.

## PRAISES STEEL CORPORATION

### Judge Clark Refuses Rehearing in Case of Wheeling Mold & Foundry Co.

WASHINGTON, Oct. 8.—The National War Labor Board has refused a rehearing to the Wheeling Mold & Foundry Co., of the decision applying the 8-hour day to the operation of that plant. The announcement of the denial is made by Walter Clark, Chief Justice of the Supreme Court of North Carolina, the umpire for the labor board, who heard the case. The motion for a rehearing was made by Walter Drew, counsel for the company. The original decision forbids the working of any employee more than eight hours in any one day, except in case of emergency, and provides that an emergency shall exist only when a committee, representative equally of employer and employees, declares it to exist.

"The chief ground urged for the rehearing," says the announcement of Judge Clark, "is that the agreement passed upon had not been actually adopted by the parties. It is true, it was a proposed agreement, but the argument on both sides presented the question whether the agreement, if adopted would mean an actual 8-hour day, or a basic 8-hour day. If it was the former, it was acceptable to the plaintiffs, the employees. If it meant the latter, it would be accepted by the defendant company and imposed upon the workers."

"The case was thoroughly argued by both sides with great force and ability, and the points at issue were clearly understood by the board and the umpire. Upon hearing the case, the decision was that an actual 8-hour day should be adopted, and as a protection against overtime 'on emergencies' it was ordered that nothing should be held an emergency unless so declared by three votes on a joint board to consist of two members to be selected by the employers and two by the employees."

"On a full and careful review of the arguments then made and the questions presented by the petition to rehear, the opinion and the award heretofore made are in every respect confirmed."

"Soon after this opinion and decision of the board had been rendered, and possibly, in consequence of it, the great United States Steel Corporation, with 300,000 employees adopted the 8-hour law and other companies are doing the same. By reason of its position as a financial and progressive institution, the action of the United States Steel Corporation marks a distinct advance toward the universal adoption of the 8-hour day, especially if there shall go with it the provision of the award in this case that there shall be no evasion of the 8-hour day upon the declaration of the employer alone of emergency, but the emergency shall be declared by a majority of the joint board appointed by the employers and employees as stated in the award in this case."

"Long since, Henry Ford, another progressive and successful employer of large bodies of men, adopted voluntarily the 8-hour day which is the end toward which industry is inevitably and irresistibly moving, by reason of it being justice to the employees and no less to the real interests of the employers and managers of our great industries."

The War Labor Board now has 600 cases pending before it. New cases, apparently are coming in much more rapidly than the old ones can be settled. Examiners of the board heard five traction cases in Washington on Monday. All were brought by the Street Railway Men's Union. They involved the Auburn, Syracuse, and Rochester, N. Y. traction companies. On the same day, examiners of the board heard the complaint of the employees of the Eugene Dietzgen Co., of Chicago; the employees of the Baker Mfg. Co., of Saratoga, N. Y.; the molders of the Baker Mfg. Co. and Davison Namack Foundry Co., of Saratoga Springs, N. Y.; the molders of the Wolfe Co.; Chambersburg Foundry & Machine Co.; T. B. Woods Sons and Hafter Foundry & Machine Co., all of Chambersburg, Pa. The following meetings are also scheduled:

Thursday, Oct. 10.—At Minneapolis, Minn., at 10 a. m., Federal Building. Machinists vs. Minneapolis Steel & Machinery Co. Before section of board consisting of Messrs. Taft, Walsh, Olander.

At New York City, 10 a. m., Council Chamber, City Hall. Machinists vs. American Locomotive Co. of Paterson, N. J. Before examiners.

Saturday, Oct. 12.—At Hartford, Conn., 10 a. m., Federal Building. Employees vs. Colt Patent Fire Arms Co. Before examiners.

### Purchasing Agents' Association Organized at Buffalo

The first regular meeting of the Buffalo Purchasing Agents' Association, recently organized in Buffalo, was held at the Hotel Iroquois Wednesday evening, Oct. 2, after a dinner participated in by about 25 members of the new organization, at which the president, J. H. Burns, presided.

The membership embraces the "Niagara Frontier," with representatives from Niagara Falls and Tonawanda, as well as Buffalo.

The officers of the association are: President, J. H. Burns, McCarthy Bros. & Ford, Buffalo; vice-president, W. E. Sault, Ramapo Iron Works, Niagara Falls; treasurer, F. J. Arthurs, Larkin Co., Buffalo; secretary, A. Lockwood, Lumen Bearing Co., Buffalo; directors, B. W. Robb, Jacob Dold Packing Co., Buffalo; S. S. Diemer, Cartorundum Co., Niagara Falls; R. J. Mulholland, Automatic Transportation Co., Buffalo. The president, Mr. Burns, and Mr. Robb, chairman of the Entertainment Committee, are also directors in the National Association of Purchasing Agents, with which the Buffalo Association is affiliated.

Twenty-three members of the new organization had attended the annual meeting of the National Association held in Detroit the preceding week and President Burns and Mr. Robb made reports on the proceedings of that convention. The members present at the local meeting also took up and discussed the question of stocks of essential materials to be carried in the winter months, covering normal and war needs, sufficient to provide against delays in transportation. They also listened to an address by Archer A. Landon, who is in charge of the Production Division of the Aircraft Board, and is vice-president of the American Radiator Co., on the subject of "Fair Play in Purchasing Ethics." Also a brief talk on "Current Conditions in the Iron and Steel Market," by Ira B. Littlefield, Buffalo representative of THE IRON AGE.

Regular meetings of the association will be held monthly, also a semi-monthly luncheon at the Chamber of Commerce.

### Banning, Cooper & Co., Ltd., Pittsburgh, Is Dissolved

Announcement is made that the limited partnership of Banning, Cooper & Co., Ltd., Pittsburgh, was dissolved by the unanimous vote of stockholders and partners Oct. 5, S. G. Cooper and George L. Claypool, of the firm, and J. Merrill Wright, attorney, being named as liquidating trustees. The firm would have expired by limitation Dec. 31, 1918, as in accordance with its custom a reorganization is required every two years.

C. F. Banning who was chairman, but who has had very little personal connection with the business since 1903, was arrested by representatives of the Department of Justice Sept. 27, as stated in THE IRON AGE of Oct. 3, charged with numerous disloyal utterances, and immediately released on bail. After two postponements a hearing was set for Wednesday of this week. Mr. Banning was naturalized in 1903, having taken out first papers several years earlier.

The business of Banning, Cooper & Co., Ltd., began Oct. 16, 1899, taking over the Western business of Naylor & Co. Many changes have occurred in the personnel of the partnership by additions and withdrawals. The original partners were Messrs. Banning and Cooper, together with Charles S. Guthrie, who left in a short time on account of his connection with the American Steel Hoop Co.

## PERSONAL

Willard E. Freeland, for the past three years New England editor of *THE IRON AGE*, has tendered his resignation in order to accept the position of assistant to



ROBERT I. CLEGG

General Manager John E. Otterson, Winchester Repeating Arms Co., New Haven, Conn., and will enter upon the discharge of his new duties this week. His contributions to these columns on works administration and manufacturing methods have been widely read and favorably commented on and his work on these problems was recognized recently by his selection to direct the inquiry made by the metal-working industries at Bridgeport, Conn., into the relation between wage advances and the higher cost of living. Robert I. Clegg, Cleveland, has been appointed to succeed Mr. Freeland as New England editor and will take up his residence in that territory this week. Mr. Clegg was born in England and had shop experience before coming to this country and also for several years at Providence, R. I. He then became machinery editor of the *Iron Trade Review*, which position he filled for a number of years, resigning it to become editor of the foundry publication *Castings*. More recently he has been vice-president of the Gardner Printing Co., Cleveland. He has long been active in the Cleveland Engineering Society, in which he has filled important official positions, being vice-president in the past two years. He has also been vice-president of the Cleveland Board of Education and a member of the Cleveland Chamber of Commerce and the Cleveland Advertising Club. He is a member of the American Society of Mechanical Engineers, chairman of the Cleveland section, A. S. M. E., and a member of the (British) Institution of Mechanical Engineers.

Frank H. Brown, one of the founders of the Brown & Zortman Machinery Co., Pittsburgh, and more recently with the Davis Machine Tool Co., Rochester, N. Y., has been appointed sales manager of the Sherritt & Stoer Co., Inc., machine tool dealer, Philadelphia, assuming his new duties on Oct. 7.

The resignation of George D. McDougall, chief engineer of the Dominion Iron & Steel Co., Sydney, N. S., New Glasgow, N. S., has been handed in to become effective as soon as possible. Mr. McDougall has accepted the position of general superintendent of the Nova Scotia Steel Co.

G. H. Mueller, chief engineer at the plant of the Curtiss Aeroplane & Motor Co., Buffalo, and designer of the Curtiss battle plane, has resigned, effective Oct. 1. George Basckoff, plant engineer for the company, has also resigned.

Charles B. Wilson, president and general manager of the Wilson Foundry & Machine Co., Pontiac, Mich., has been elected a director of the Curtiss Aeroplane & Motor Co., Buffalo, with the office of vice-president in charge of production. Since the resignation of B. A. Guy, he has been acting as assistant general manager.

C. A. Ilgenfritz has just been named purchasing agent for the Brier Hill Steel Co., Youngstown, Ohio, succeeding W. C. Munn, who resigned to take a position in the Ordnance Department of the Government, at Washington.

Major General George W. Goethals has been made a member of the War Industries Board. He is Assist-

ant Chief of the General Staff and Director of the Division of Purchase, Storage and Traffic. As such his work brings him into close and frequent contact with the operations of the War Industries Board. General Goethals takes the place on the board formerly filled by his recent assistant, Brigadier General Hugh A. Johnson, who has been assigned to a field brigade for active service.

R. J. Mullaly, assistant superintendent at the Youngstown, Ohio, mills of the Carnegie Steel Co., has been promoted to superintendent of the McDonald mills, located between Girard and Niles, Ohio, succeeding W. U. Dennison, under whose supervision the plant was constructed.

James H. Nutt, secretary of the Western Bar Iron Association, arrived at his home in Youngstown, Ohio, Sunday night from Los Angeles, Cal., where he was called to assist in adjusting a dispute at a mill rolling iron. John Williams, president of the Amalgamated Association of Iron, Steel and Tin Workers, also made the trip and took part in the conferences. It is stated that the trouble has been settled.

Frank P. Fahy, consulting magnetic engineer, Hudson Terminal Building, New York, has been awarded by the city of Philadelphia, acting on the recommendation of the Franklin Institute, the John Scott legacy medal and premium for the development of the Fahy permeameter.

Some changes are announced at the open hearth department of the Republic Iron & Steel Co.'s mills at Youngstown, Ohio, as a result of the resignation of George W. Pepper, who has been the general superintendent, and who shortly leaves for Buffalo to become manager of the works of the Donner Steel Co. The position of superintendent of blast furnaces and general superintendent of the open-hearth department has been merged, and C. E. Crothers, formerly at the head of the blast furnace department, has been promoted and his duties enlarged. W. E. Leventry, who went to the Republic Iron & Steel Co. some six months ago, has been made superintendent of the open-hearth department.

F. J. Ryan has disposed of his interest in and resigned as secretary-treasurer and general manager of the Electric Furnace Construction Co., Philadelphia, to become secretary-treasurer and general manager of the American Metallurgical Corporation, Franklin Trust Building, Philadelphia, in which he is one of the stockholders. The American Metallurgical Corporation controls the Philadelphia Electric Steel Corporation, producer of electric steel castings, with a plant located at Conshohocken, Pa., of which concern Mr. Ryan is also general manager. The business of the corporation covers the conditions entering into the design of all types of electric furnaces for melting and heat treatment. An experimental plant is being erected at Conshohocken, Pa., where tests on steel and alloys will be conducted.

S. R. Vanderbeck, who has resigned as vice-president of the Electric Furnace Construction Co. Philadelphia, has been elected president of the American Metallurgical Corporation. S. H. Ourbacker, electrical engineer, and F. H. Shaw, purchasing agent, have also resigned from the former concern to take up respective positions with the American Metallurgical Corporation.

Henry A. Butler, chief of the order department of the Youngstown Sheet & Tube Co., and the only son of Joseph G. Butler, Jr., Youngstown, Ohio, expects to sail shortly for Europe to do Red Cross work.

Harold A. Stoddard has been appointed safety engineer of the Wagner Electric Co.'s plant at St. Louis.

M. E. Singleton, chief of the St. Louis district of the Ordnance Department, has appointed Don A. Barrus field manager of publicity, with headquarters at St. Louis, to obtain full production of war material manufactured in that district.

Willis Warner has been made general chemist of the Republic Iron & Steel Co., Youngstown, Ohio, and placed in charge of the open-hearth and blast furnace laboratories, succeeding T. J. Davies, resigned. Mr. Warner



has been succeeded at the Bessemer laboratories by Joseph Mayberry.

Thomas MacDonald, consulting engineer of the Carnegie Steel Co. for the Youngstown district, has been named chairman of the Youngstown committee of the Council of National Defense, to pass upon new construction projects under the War Industries Board's order that no construction work involving more than \$2,500 outlay shall be undertaken without approval.

Charles H. Williams, assistant superintendent of the Donora, Pa., works of the American Steel & Wire Co., has resigned, effective Sept. 30. Mr. Williams has accepted a position with the Penn Seaboard Corporation at its Wilmington, Del., plant.

M. D. Rowe, of the American International Steel Corporation, is now on his way to South America, where he will be gone some two months or more visiting the company's branches in Brazil, Argentina and Uruguay.

George W. Carr, formerly advertising manager of the Camden Forge Co., Camden, N. J., has joined the colors and is now with the 472d Engineers' Detachment, Camp Humphreys, Va.

### Steel Industry of Australia

WASHINGTON, Oct. 8.—The Bureau of Foreign and Domestic Commerce has received a report from Howard A. Pratt, secretary to the commercial attaché at Melbourne, Australia, which reflects an increase in the steel industry there. He quotes the report of Broken Hill Proprietary Co., Ltd., showing that its production of pig iron for the six months ending May, 1918, was 67,803 tons, against 41,351 tons in the six months ending November, 1917. For the same period, the output of steel ingots jumped from 52,878 tons to 89,011 tons; of coke, from 35,044 to 74,025; of sulphate of ammonia, from 598 to 1,120, and of tar, from 345,911 gallons to 777,324 gallons.

The erection of a second blast furnace, says the report, has been practically completed, except that the turbo blower ordered 18 months ago from England has not yet been shipped. Pending its arrival, the power plant and stoves of the old No. 1 furnace will be connected with the new furnace and the old stack will be completely overhauled. The directors state that the company is now rolling plates 20 ft. long by 5 ft. wide, down to ½ in. in thickness, 1000 tons having already been produced. By the end of September, with new housings in operation, plates down to ¼ in. should be available. In referring to the work of the rail mill, the general manager says that sufficient structural material for six ships was rolled and delivered.

During the half year ended May 31, the Broken Hill Proprietary Co. made a gross profit of £629,000 (\$3,661,000). This was, however, reduced to a net profit of £359,000 after the board made provision for general taxation totaling not less than £215,000, together with the debenture, interest, sinking funds, etc., amounting to £54,000, and reserve fund £20,000. Dividend paying was maintained at the same rate as during the previous term.

### British and French Ask for Browning Guns

Brig.-Gen. Samuel McRoberts, head of the procurement division, Ordnance Department, U. S. A., has returned to Washington from a two months' tour of inspection in England and France. On his return trip General McRoberts flew from Paris to London in an airship.

Declaring that the Browning gun is now being delivered in quantity to the American forces in France, he said that the gun has thus far so successfully met the various tests imposed upon it over there that the British and French governments have asked that any surplus number produced be made available for use by the British and French armies.

General McRoberts said concerning ordnance material captured from the Germans in recent months that the enemy, wherever possible, is using substitutes for the metals other than steel, notably, for brass and copper.

### No Material or Labor for Soldiers' Monuments

WASHINGTON, Oct. 8.—The War Industries Board has set an important precedent for construction projects throughout the country by declining permits for a temporary memorial in Chicago for soldiers and sailors who have fallen in this war. The proposal called for the expenditure of only \$35,000, and the request sent by Samuel Insull, chairman of the Illinois State Council of Defense declared its rejection might have a "bad effect" in Chicago. This, however, did not move the War Industries Board.

"As you know," wrote Chairman Baruch in reply, "it has become necessary to withhold permits for the building of school houses, churches, hospitals and numerous other projects of great local public interest, which in normal times would be encouraged and stimulated, so that labor and material may be released for war industries urgently requiring them."

"Clearly non-war needs however urgent, must, in the national interest, make way for the requirements of the war program."

"In considering Chicago's memorial plan, we must remember that it is now purely local, but a nationwide precedent will be established which would mean that if this temporary memorial should be erected by Chicago and other cities should follow her example deep inroads would be made on labor, material and transportation as well as capital needed for the war."

"All of us here are unwilling that anyone should outstrip us in paying homage to the brave and loyal patriots who have given their lives that Democracy may live. The only question to determine is how we can best do them honor. Is it by following their example and by making every possible sacrifice in concentrating the industrial forces of the nation in a supreme drive to bring this war to a speedy and victorious end, or shall we pause now and utilize labor, material and transportation urgently needed in war industries to erect to them a temporary memorial which will pale into insignificance as compared with the things they fought and died for and which they would have us continue to fight for to the exclusion of everything else in the world until victory is ours?"

### Proposed Changes in Customs Administration

WASHINGTON, Oct. 8.—Important changes in the laws governing the collection of duties on imports are recommended in a special report made to the Ways and Means Committee of the House of Representatives by the United States Tariff Commission. This is the first real attempt to codify the various customs administrative laws. The report is an exhaustive one and contains the text of a general statute to take the place of the cumbersome laws now in force. The new law would contain about one-third of the text of the present one eliminating long special clauses governing individual details.

The most important of the proposed changes affects the organization of the personnel of the service. If adopted, it would take the appointment of collectors and appraisers out of the hands of the President and put it in the hands of the Secretary of the Treasury where they would automatically be made subject to civil service rules. The term of office for collectors would be extended from 4 to 6 years.

An improvement in the Schoop metal-spraying process is reported in *Engineering*, London. Instead of melting the metal, which is generally applied, in the shape of a wire, by the oxy-hydrogen flame or the blowpipe electric fusion is now used and is said to be both simpler and cheaper. The pistol apparatus is employed as before; but two ends of the wire are placed in the pistol, instead of one, and they are approached to one another as electrodes of an electric circuit. When the arc strikes, the wire fuses, and the air current tears the fine metallic particles away. Zinc sprays in particular have been produced in this way.

# Electric Arc and Oxy-Acetylene Welding

## Two Processes Compared—Troubles in Welding Castings, Plates and Dissimilar Metals Discussed—Uses of Butt Welding

**T**HREE papers on welding were presented this past summer before the Cleveland Engineering Society. "Electric Arc Welding," by Robert E. Kinkead, engineer of welding, Lincoln Electric Co., Cleveland; "Oxy-acetylene Welding and Cutting," by Hugh H. Dyar, Davis-Bournonville Co., Cleveland; and "Electric Butt Welding," by J. B. Clapper, plant engineer, rim and tube division, Standard Parts Co., Cleveland.

Comparing the electric arc and oxy-acetylene processes, Mr. Kinkead stated that with few exceptions the same operations may be accomplished with either the oxy-acetylene or electric arc process. The electric arc has a higher temperature than the oxy-acetylene flame and the great part of its heat is produced in an extremely localized area within the metal to be welded rather than external to it, as is the case in the oxy-acetylene flame. The heat of the arc being produced in the metal is more efficiently used, so that it is possible to do at least three times as much welding with a given amount of heat produced by the electric arc as would be possible with the same amount of heat produced by the gas process.

"The cost of producing a unit of heat for autogenous welding with the present prices of gas and electric power is," said Mr. Kinkead, "about in a ratio of gas, 3; electric, 1. With an 'effectiveness' factor of about 1 to 3 in the use of the two processes, it is evident that the cost of gas is in the neighborhood of nine times the cost of electric power doing the same work."

"Up to the present time the electric arc welding process has been used almost exclusively in the welding of steel," he continued. "The very great localization of heat of the arc gives it a marked advantage over the oxy-acetylene plant for welding on boiler plate and sheet metal. The difficulties arising from expansion and contraction with the attendant buckling of the plate and cracking of the weld encountered in the use of the gas process are, to a certain extent, eliminated in the arc process due to this localization of the heat."

"Gray iron may be welded with the carbon arc welding process, but the operation is somewhat more difficult than welding with the gas flame, and perhaps requires more skill on the part of the operator."

### Welding of Cast Iron and Steel

The welding of cast iron, Mr. Kinkead emphasized, is rather a difficult matter, with either process. The difficulty is not due to the welding of cast iron—it can readily be welded—but due to the expansion and contraction strains it may crack, and the weld, if it is not properly cooled, is apt to be hard. In the case of a thin section as an automobile cylinder the weld cannot be handled successfully with the carbon arc, due to the fact that the carbon arc will go through before the weld can be made, whereas with oxy-acetylene the operator can back off and reduce the temperature. Relative to building-up operations, Mr. Kinkead stated that the metal-electrode was used more than the carbon for the reason that the heating for the metal-electrode process is localized.

### Various Applications of Electric Welding

One of the most interesting applications of the electric arc welding process, Mr. Kinkead pointed out, is in the locomotive shops and roundhouses of the country. "It is used to weld the flues into the back flue-sheet of the boiler; to weld cracks and patches in the fire-box; to weld in new sections of the flue-sheet, door-sheet or side-sheets; to repair broken frames without dismantling the engine. Worn links, guides, hangers, etc., are built up with new metal, re-machined and put

into service in a few hours time. Worn flanges on the drive wheels are built up without dropping the wheels, and the engine is put in service without turning the tire."

In answer to questions, Mr. Kinkead explained many points of interest that arise in the use of the electric arc. Relative to the welding of dissimilar metals, he stated that the electric process can be used to deposit steel on cast iron and the union between the cast iron and steel is good, that is, it is a fusion; but the difficulty is that the steel and iron are molten at the same instant, with the result that the molten steel absorbs the carbon, and we get high carbon steel on the steel side of the weld, so that there is a line of fusion; one side is steel and the other cast iron. On the cast iron side a small area only of the cast iron is raised to the molten state, which, cooling quickly, becomes hard and brittle, so that on the line of fusion there are two kinds of metal, both of which are very hard and brittle. Such metal is unreliable and will not stand any dynamic stress. Mr. Kinkead further said that brass cannot be welded to cast iron because the zinc in the brass volatilizes in the high temperature of the arc, whereas copper and steel can be welded to a perfect joint, as can bronze if it contains no zinc.

### Electric Welding of Plates

The subject of the thickness of plates that can be welded was also discussed. Much cannot be done, Mr. Kinkead stated, with metal  $\frac{1}{8}$  in. thick or less. Where it is too thin, say  $\frac{1}{16}$  in., and it is desired to weld a straight butt joint, a heavy backing has to be used to carry the heat away, otherwise the heat of the arc will burn through. For  $\frac{3}{16}$ -in. plates no backing is required. Under certain conditions, trouble may be experienced due to the sheet metal welding to the backing. In these cases, if a copper backing is used, no difficulty is experienced as the copper conducts heat much more rapidly than steel or iron.

Regarding the welding of manganese steel, Mr. Kinkead said that in the cross-over work and special frogs and switches a steel which has practically the same composition as the original, about 12 per cent manganese, can be put down. In this case, however, it has been found to work best if the electrode is used as positive and the work as negative. In this case, 12 per cent manganese wire would of course be used.

In regard to the light of the arc injuring the eyes, the speaker stated that the rays act just like sunburn, in that the light will burn if you expose your naked eyes to it. It will sear the outside of the eyeball and will make the eye sore for about a day after careless exposure, but it is not likely to permanently injure the eye.

### Flame Welding of Cast Iron

Applications of oxy-acetylene welding for specific purposes were given by Mr. Dyar. "In welding cast iron," he said, "the piece is first prepared by chipping out the crack in the form of a V so that the weld can be made the entire thickness of the metal, thus producing a weld of full strength. In handling cast iron where the shape is somewhat irregular, as is usually the case, the proper heat treatment is fully as important as the actual making of the weld. For ordinary work the casting should be heated very slowly, usually in a charcoal fire, until it has become a dull red and any expansion strains taken care of; the weld should then be made while it is still at this temperature and afterwards cooled down very slowly."

Relative to the difficulty often spoken of in welding cast iron in which the welded spot is too hard to be ma-

chined, Mr. Dyar said that this can be prevented largely by the proper heat treatment, but that there are, however, a number of other things that have a bearing on this. For instance, if a neutral flame or a flame that contains a little excess of acetylene be used, the probabilities are that a soft weld will result.

As to the cause of the hardness, Mr. Dyar said: "My theory of that is that if the welder is not quick with his work, or if he uses a torch that produces an excess of oxygen in the flame, he is liable to burn out of the cast iron the free carbon. As we all know, it is the free or graphitic carbon in the cast iron that makes it soft. If you burn that out, you approach to a greater or less degree the white iron, which has practically no free carbon in it. I have heard a number of other theories, but I believe the one I just gave is probably the most accurate. If you watch the weld and see that the torch does not give an excess of oxygen you will not have a great deal of trouble." Sometimes, he said, if a cast iron weld is allowed to cool too rapidly it will be chilled and often extremely hard. Another factor is the filler rod. The silicon in the filler rod, he pointed out, is to absorb or do away with the phosphorus and sulphur and other elements of the iron that would be destructive, and the filler rod also contains quite a high percentage of carbon. "If you can get free carbon in the weld it will be soft, and if you do not it is pretty likely to be hard."

#### Flame Welding of Steel Plates

The speed of steel welding, Mr. Dyar said, varies almost directly as the thickness of the metal varies; for instance, on No. 14 gage a good welder will run along at the rate of 6 in. a minute, whereas on  $\frac{3}{4}$ -in. plate a man probably would not weld more than 1 or 2 ft. per hr. Relative to the tensile strength of the weld as compared to the original metal, he said: "We find in practice that where the weld is of the same thickness as the plate you can count on around 75 or 80 per cent for an average job." He pointed out that "It is practicable wherever possible to make the weld of greater cross section than the sheet, in which case you can always count on over 100 per cent joint. The increase in cross-section would be about 25 per cent, and I believe if you pull a weld of that kind properly made it will not break in the weld."

#### Flame Welding of Die Castings

"Up until about a year ago if we got a die casting in the shop," Mr. Dyar said, "we would let it stay there until some one came and got it. We could not do much with it. But I find now that most all of the die casting alloys can be handled to a more or less satisfactory degree by the use of tin. We have done some very satisfactory jobs on automobile parts and lubricator parts and pump parts and magneto parts, die castings, by simply using block tin."

#### Oxy-acetylene Cutting

On the subject of the cutting of steel with the oxy-acetylene flame, Mr. Dyar said: "Steel up to a thickness of about 20 in. can be cut by a tiny flame about as rapidly as wood can be sawed. The torch used for this work is similar to the welding torch, except that in addition to the regular oxy-acetylene flame a jet of pure oxygen can be turned on which actually does the cutting. The piece to be cut is heated on the edge with the regular flame, after which the oxygen is turned on. A hand-torch is used for miscellaneous work such as cutting out patches in boilers, cutting irregular shapes in plate which were formerly punched out, cutting steel T beams and in wrecking steel buildings. In a number of cases this work has been done at from one-fourth to one-sixth the cost of any other method. One important use is the cutting of risers on steel castings."

"Comparing the oxy-acetylene and oxy-hydrogen flame," the speaker said, "for cutting up to, I would say, 8 or 10 in. thick, the oxy-acetylene is best and cheaper. For cutting over 10 in. thick, and from there on up to the limit, the oxy-hydrogen flame is better. I believe one reason is that the oxy-hydric flame is not a

short flame; it is more likely to be a long tongue that comes down into the cut and keeps the oxide flowing out. If you do not get the heat deep enough you are liable to get a frozen cut."

#### Electric Butt Welding

Electric butt welding, Mr. Clapper explained, is used extensively in the metal industries in the uniting of forged parts into one complete part which would be impracticable to make in one forging, the uniting of forgings to tubular and rod parts; welding wheel rims and bands, and so forth; high carbon and alloy steels, welding the longitudinal seams of formed steel tubing, uniting of dissimilar metals, as steel and brass. He pointed out that while butt welding work may be done to conform to certain over-all dimension limits of the welded piece, practically no attempt is made to work to absolute dimensions. In the forming and welding of rims, bands and so forth, the ring after welding will only approximate the finished circumference dimension. In ring welding work it is therefore necessary to put the rings through a sizing operation, which may be accomplished by either shrinking or stretching. Except on the heavier sections this sizing is done with metal cold. The stretching operation is an excellent test of the weld. In the making of electric welded tube, the forming and welding is done to base dimensions, the finished size being produced by drawing or swaging.

In practice it is often desirable to add to the length of a piece of steel shafting, or perhaps cut off a worn section and weld on a new piece. To insure a true running shaft, the speaker said, the practice is to weld on a piece of larger diameter than that of the section to which it is joined. This is then put into a lathe and turned to size. The butt welding of tube seams presents difficulties not encountered in the ordinary joining of parts. A specially designed machine is used through which the formed tube is passed, the welding being accomplished while the tube is in motion. Removing of the burr after welding, Mr. Clapper said, is necessary except in a few instances. The inside burr in welded tubing is, for some kinds of work, not objectionable and may be left in. This burring operation may be accomplished in several ways. It is removed from tubing by passing the tube under several cutting tools and finished by grinding. Rod work is put in a lathe and turned off. The burr may be removed from bar welds by either a burring tool or a gas flame.

In every field within its scope where electric resistance welding has become a competitor of other processes of welding, Mr. Clapper claimed, it has been found more economical. Being free from objectionable features of smoke, glare, soot and dirt, so common with other processes, a greater output per man can be obtained with less fatigue and less operating cost.

#### Squirrel Cage Elevator Motor Control

An elevator control to be used with squirrel cage motors in sizes up to and including 20 hp. at car-speeds not exceeding 150 ft. per minute has been built by the Westinghouse Electric & Mfg. Co., East Pittsburgh, for freight and passenger service. The equipment for this elevator control, type E, is simple, consisting of a small control panel mounted on the wall near the motor, a car switch, by means of which the operator controls the movement of the elevator cars, and such elevator safety devices as may be desired. A line contactor and two mechanically interlocked directional contactors are mounted on a black marine finished slate base. The motor, being started with full line voltage, requires no secondary or accelerating contactors. The equipment is simple in construction and quiet in operation. All parts are easily accessible for inspection or repairs. The contacts are graphite to graphite of the butt type, and are interchangeable for the various contactors. The same contacts may be used for alternating-current and direct-current type E controllers for both car-switch and push-button operation. The car switch closes the line contactors and one of the directional contactors, and thus starts the car in the desired direction.



## OBITUARY

### W. J. Keep

William J. Keep, for many years consulting engineer for the Michigan Stove Co., Detroit, and one of the best known writers of the country on foundry topics, died



W. J. KEEP

Monday, Sept. 30, at his home in Detroit following an accident. He was knocked to the pavement by either a street car or an automobile and succumbed a few hours later. Mr. Keep was born in June, 1842, at Oberlin, Ohio. He attended Oberlin College for the freshman and sophomore years and was graduated from Union College, Schenectady, N. Y., in 1865 with the degree of civil engineer. He worked in the shop of Fuller, Warren & Co., Troy, N. Y., in 1865; was employed by Hubbell & Bros., Buffalo stove manufacturers, from 1865 to 1868, and was with Fuller, Warren & Co.

from 1868 to 1875. From 1875 to 1884, he manufactured stoves at Troy on his own account. He was a member of the American Society of Mechanical Engineers, American Institute of Mining Engineers, the (British) Iron and Steel Institute, International Association for Testing Materials, American Foundrymen's Association and various other associations. In 1902 his book "Cast Iron" was published and is the best known product of his pen. In 1885, Mr. Keep brought out some results of his studies into the relation between the shrinkage of cast iron and the composition of a foundry mixture. Later, on the publication of Professor Turner's discovery that the condition of carbon depended upon the proportion of silicon, Mr. Keep demonstrated that shrinkage varied inversely as silicon. He thereupon devised a method and apparatus known as "Keep's Test" for the determination of shrinkage in cast iron, and in this way to regulate the cupola mixture. For this purpose he used a 1/2-in. test bar. He elaborated his method of testing after making many thousands of tests in the investigation of the relation between the chemical analysis of cast iron and its physical properties. The results were contributed to the transactions of the American Institute of Mining Engineers prior to 1894. As a member of the Testing Committee of the American Society of Mechanical Engineers Mr. Keep continued his extensive experiments to determine the physical properties of cast iron and the results are recorded in the Transactions of that society.

CHARLES GUSTAVUS ROEBLING, president of the John A. Roebling's Sons Co. of Trenton and Roebling, N. J., and of the New Jersey Wire Cloth Co., Trenton, and vice-president of the John A. Roebling's Sons Co., New York, died Oct. 5 at his home in Trenton, aged 69 years. Mr. Roebling was born in Trenton, graduated from Rensselaer Polytechnic Institute in 1871 and for a number of years was mechanical engineer of the John A. Roebling's Sons Co. With his brother, Washington Augustus Roebling, he had a large part in the completion and construction of the Brooklyn bridge, which was started by their father, John A. Roebling. He was also actively identified with many other engineering projects.

MAJ. HENRY CLAY EVANS, sales agent at 30 Church Street, New York for the Lorain Steel Co., died at his home, 50 Montgomery Place, Brooklyn, on Oct. 8 of

pneumonia, following an attack of influenza from which he thought he had fully recovered. His long connection with the steel business, dating from his association with Johnson & Co., Johnstown, Pa., and continuously with the organizations which grew out of it earned for him the title of dean of the selling forces of the United States Steel Corporation. He leaves a widow, a daughter and two sons.

GEORGE R. CASEY of the steel sales department of the Federal Export Corporation, 42 Broadway, New York, died Oct. 3 at the Post Graduate Hospital New York, of pneumonia. Mr. Casey was a native of Johnstown, Pa., and for a number of years was connected with the Cambria Steel Co. in that city. Later he was employed in the sales office of the Midvale Steel & Ordnance Co. at Philadelphia.

GEORGE E. PRICE, salesman in the Pittsburgh office of the Youngstown Sheet & Tube Co., died at Camp Lee, Virginia, Oct. 3 of pneumonia following an attack of influenza. Interment was at Youngstown, Ohio, his former home. Mr. Price entered Camp Lee as a private and was subsequently promoted to corporal and later to sergeant in a training brigade.

HARRY J. SHOEMAKER, Philadelphia, secretary of the Pennsylvania Manufacturers' Association since its organization, 1909, died Oct. 2 in his apartments in the Young Friends' Association Building, aged 63 years. He was senior member of the firm of Shoemaker & Satterthwaite, Doylestown, at the time of his death.

H. CLAY STIER, Pittsburgh, treasurer of the Railway & Industrial Engineering Co., Greensburg, Pa., died Oct. 2, through self-inflicted injury attributed to ill health. He was about 42 years of age.

JOHN F. OLTROGGE, vice-president of the F. Wesel Mfg. Co., Brooklyn, manufacturer of machinery, died at his home in West Islip, L. I., Sept. 30, at the age of 65 years.

NELSON F. SHUNK, prominent Bucyrus, Ohio, manufacturer, owning a half interest in the Shunk Plow Co. of that city, died Sept. 29 of apoplexy, aged 68 years.

LEANDER J. HOOVER, founder, president and general manager of the Hoover Steel Ball Co., Ann Arbor, Mich., died Sept. 23 at his home, aged 42.

### Rapidly Rebuilding Morgan Plant

WASHINGTON, Oct. 8.—The Ordnance Department took prompt steps to begin the work of rebuilding the T. N. T. plant at Morgan, N. J., wrecked last week by a disastrous explosion. Even before the fire was under control and the last explosion had endangered the lives of the officials who had hurried to the scene, the Department had awarded the contract for rebuilding to the T. A. Gillespie Sons & Co., operators of the destroyed plant. Laborers were at once mobilized and started for Morgan where a contractor's organization was already on the ground. This action was necessary because of the important part which the output of trinitrotoluol plays in our ammunition supply.

The erection of a T. N. T. plant at Giant, Cal., has also been authorized by the War Department. The estimated cost is \$1,438,000.

Two sulphuric acid plants are to be erected in Pennsylvania under the supervision of the Construction Division of the Army. The estimated cost for both plants is \$3,000,000. One plant will be located at Emporium while the other will be erected at Mt. Union.

The Perfection Metal Products Co., College Point, N. Y., recently organized to manufacture metal stampings, special tubular products, etc., has elected William C. Lange, an officer of the Empire Art Metal Co., as its president and Andrew J. Connell, also an officer of the Empire Art Metal Co., as secretary and treasurer. Associated with them is the pioneer manufacturer, John W. Rapp. The chief sales office will be located at College Point.

# United States Pig Iron Production—First Half of 1918

The American Iron and Steel Institute has issued its special statistical bulletin No. 3, which gives the production of all kinds of pig iron in this country for the first six months of the present year. In each of the three preceding six-month periods, the production had exceeded 19,000,000 tons, but for the first half of 1918, the total was only 18,227,730 tons. The production of charcoal pig iron for the six months was 173,394 tons compared with 180,235 tons in the first half of 1917 and 196,290 tons in the second half of 1917. The details of the half year's output are as follows:

## HALF-YEARLY OUTPUT OF PIG IRON BY STATES.

### HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON.

| States             | Blast furnaces.              |                |        | Production—Gross tons.<br>(Includes spiegeleisen, ferro-mang.,<br>ferro-silicon, ferro-phosphorus, etc.) |                         |                        |
|--------------------|------------------------------|----------------|--------|--|-------------------------|------------------------|
|                    | In blast<br>Dec. 31<br>1917. | June 30, 1918. |        | First half<br>of 1917.   | Second half<br>of 1917. | First half<br>of 1918. |
|                    | In.                          | Out.           | Total. |  |                         |                        |
| Massachusetts..... | 1                            | 1              | 2      | 4,305  | 6,222                   | 5,470                  |
| Connecticut.....   | 2                            | 2              | 4      |  |                         |                        |
| New York.....      | 21                           | 24             | 26     | 1,118,482  | 1,299,045               | 1,339,472              |
| New Jersey.....    | 5                            | 4              | 9      |  |                         |                        |
| Pennsylvania.....  | 122                          | 137            | 162    | 7,790,514  | 7,749,214               | 7,121,903              |
| Maryland.....      | 2                            | 4              | 6      | 234,589  | 187,623                 | 174,408                |
| Virginia.....      | 15                           | 13             | 19     | 231,937  | 288,374                 | 263,676                |
| Alabama.....       | 34                           | 31             | 46     | 1,494,479  | 1,459,226               | 1,286,571              |
| Georgia.....       | 1                            | 0              | 4      |  |                         |                        |
| Texas.....         | 0                            | 0              | 2      |  |                         |                        |
| West Virginia..... | 4                            | 5              | 7      | 282,548  | 279,403                 | 264,151                |
| Kentucky.....      | 3                            | 0              | 1      |  |                         |                        |
| Mississippi.....   | 10                           | 12             | 16     | 201,296  | 168,655                 | 189,978                |
| Tennessee.....     | 64                           | 71             | 78     | 4,269,708  | 4,248,895               | 4,059,603              |
| Ohio.....          | 17                           | 24             | 25     | 1,810,137  | 1,646,778               | 1,505,113              |
| Indiana.....       | 13                           | 15             | 15     | 1,300,122  | 1,457,381               | 1,402,667              |
| Michigan.....      | 12                           | 11             | 14     |  |                         |                        |
| Wisconsin.....     | 5                            | 4              | 8      |  |                         |                        |
| Minnesota.....     | 3                            | 3              | 3      | 392,864  | 345,677                 | 368,469                |
| Missouri.....      | 2                            | 2              | 2      |  |                         |                        |
| Iowa.....          | 0                            | 0              | 0      |  |                         |                        |
| Colorado.....      | 3                            | 4              | 6      | 227,254  | 226,488                 | 246,249                |
| Oregon.....        | 0                            | 0              | 1      |  |                         |                        |
| Washington.....    | 0                            | 1              | 1      |  |                         |                        |
| California.....    | 0                            | 0              | 0      |  |                         |                        |
| Total.....         | 339                          | 371            | 455    | 19,258,235   | 19,362,981              | 18,227,730             |

### HALF-YEARLY PRODUCTION OF COKE PIG IRON.\*

| States             | In blast<br>Dec. 31<br>1917. | June 30, 1918. |        | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--------------------|------------------------------|----------------|--------|------------------------|-------------------------|------------------------|
|                    | In.                          | Out.           | Total. |                        |                         |                        |
| New York.....      | 21                           | 24             | 25     | 1,117,918              | 1,294,237               | 1,334,792              |
| New Jersey.....    | 4                            | 4              | 4      |                        |                         |                        |
| Pennsylvania.....  | 107                          | 127            | 144    | 7,596,452              | 7,575,164               | 7,005,488              |
| Maryland.....      | 2                            | 3              | 4      | 234,589                | 187,623                 | 174,206                |
| Virginia.....      | 15                           | 13             | 17     |                        |                         |                        |
| Georgia.....       | 1                            | 0              | 2      | 231,937                | 294,888                 | 264,396                |
| Texas.....         | 0                            | 0              | 1      |                        |                         |                        |
| Alabama.....       | 32                           | 30             | 44     | 1,475,063              | 1,438,778               | 1,273,905              |
| West Virginia..... | 3                            | 3              | 4      | 282,548                | 272,886                 | 263,431                |
| Kentucky.....      | 4                            | 5              | 7      |                        |                         |                        |
| Tennessee.....     | 9                            | 11             | 15     | 200,874                | 166,294                 | 189,852                |
| Ohio.....          | 64                           | 71             | 78     | 4,269,708              | 4,248,895               | 4,059,603              |
| Indiana.....       | 17                           | 24             | 25     | 1,810,137              | 1,646,778               | 1,505,113              |
| Michigan.....      | 13                           | 15             | 15     | 1,263,426              | 1,474,980               | 1,430,080              |
| Wisconsin.....     | 3                            | 3              | 3      |                        |                         |                        |
| Minnesota.....     | 4                            | 3              | 6      |                        |                         |                        |
| Missouri.....      | 3                            | 3              | 3      |                        |                         |                        |
| Iowa.....          | 1                            | 1              | 1      |                        |                         |                        |
| Colorado.....      | 3                            | 4              | 6      | 402,028                | 368,537                 | 433,064                |
| Washington.....    | 0                            | 1              | 1      |                        |                         |                        |
| Oregon.....        | 0                            | 0              | 1      |                        |                         |                        |
| California.....    | 0                            | 0              | 0      |                        |                         |                        |
| Total.....         | 306                          | 345            | 406    | 18,874,680             | 18,988,963              | 17,933,932             |

\*Includes ferro-alloys made with electricity.

### ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

| States            | In blast<br>Dec. 31<br>1917. | June 30, 1918. |        | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|-------------------|------------------------------|----------------|--------|------------------------|-------------------------|------------------------|
|                   | In.                          | Out.           | Total. |                        |                         |                        |
| New Jersey.....   | 1                            | 0              | 1      |                        |                         |                        |
| Pennsylvania..... | 14                           | 9              | 13     | 203,320                | 177,728                 | 120,404                |
| Total.....        | 15                           | 9              | 14     | 203,320                | 177,728                 | 120,404                |

### HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

| States             | In blast<br>Dec. 31<br>1917. | June 30, 1918. |        | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--------------------|------------------------------|----------------|--------|------------------------|-------------------------|------------------------|
|                    | In.                          | Out.           | Total. |                        |                         |                        |
| Massachusetts..... | 1                            | 1              | 2      | 4,305                  | 6,222                   | 5,470                  |
| Connecticut.....   | 2                            | 2              | 4      |                        |                         |                        |
| New York.....      | 0                            | 0              | 1      |                        |                         |                        |
| Pennsylvania.....  | 1                            | 1              | 4      | 1,306                  | 1,130                   | 691                    |
| Maryland.....      | 0                            | 1              | 1      |                        |                         |                        |
| Virginia.....      | 0                            | 0              | 2      | 19,410                 | *20,548                 | 12,866                 |
| Alabama.....       | 2                            | 1              | 2      |                        |                         |                        |
| Georgia.....       | 0                            | 0              | 2      |                        |                         |                        |
| Texas.....         | 0                            | 0              | 1      |                        |                         |                        |
| Tennessee.....     | 1                            | 1              | 1      | 422                    | 2,361                   | 126                    |
| Mississippi.....   | 0                            | 0              | 1      |                        |                         |                        |
| Michigan.....      | 9                            | 8              | 11     | 124,618                | 133,633                 | 124,209                |
| Wisconsin.....     | 1                            | 1              | 2      |                        |                         |                        |
| Missouri.....      | 1                            | 1              | 1      | 30,168                 | *32,396                 | 30,032                 |
| Total.....         | 18                           | 17             | 35     | 180,235                | *196,290                | 173,394                |

\*Includes a small tonnage made with charcoal and coke.

### TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

| Fuel            | In blast<br>Dec. 31<br>1917. | June 30, 1918. |        | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|-----------------|------------------------------|----------------|--------|------------------------|-------------------------|------------------------|
|                 | In.                          | Out.           | Total. |                        |                         |                        |
| Coke.....       | 306                          | 345            | 406    | 18,874,680             | 18,988,963              | 17,933,932             |
| Anthracite..... | 15                           | 9              | 14     | 203,320                | 177,728                 | 120,404                |
| Charcoal.....   | 18                           | 17             | 35     | 180,235                | 196,290                 | 173,394                |
| Total.....      | 339                          | 371            | 455    | 19,258,235             | 19,362,981              | 18,227,730             |

\*Includes ferro-alloys made with electricity.

†Includes mixed anthracite and coke pig iron.

‡Includes small tonnage made with charcoal and coke.

## HALF-YEARLY OUTPUT OF PIG IRON BY GRADES.

### HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

| States                                     | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--|------------------------|-------------------------|------------------------|
| New York, New Jersey.....                  | 535,286                | 627,367                 | 658,750                |
| Pennsylvania—Allegheny County.....         | 1,787,309              | 1,901,228               | 1,684,024              |
| —Other counties.....                       | 2,330,287              | 2,320,621               | 2,157,670              |
| Virginia, Alabama, Kentucky.....           | 770,687                | 748,795                 | 635,019                |
| Ohio.....                                  | 1,412,324              | 1,875,056               | 1,844,630              |
| Indiana, Illinois.....                     | 1,466,677              | 1,610,138               | 1,617,829              |
| Michigan, Minn., Missouri, Cal., Wash..... | 308,104                | 267,853                 | 319,764                |
| Total.....                                 | 8,620,604              | 9,051,058               | 8,617,692              |

### HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

| States  | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|---|------------------------|-------------------------|------------------------|
| New York, New Jersey.....                     | 224,345                | 254,484                 | 193,063                |
| Pennsylvania.....                             | 2,943,671              | 2,741,346               | 2,603,066              |
| Maryland.....                                 | 214,632                | 175,916                 | 170,153                |
| West Virginia, Kentucky, Tenn., Ala.....      | 249,427                | 238,082                 | 201,726                |
| Ohio.....                                     | 2,235,910              | 2,074,864               | 1,897,569              |
| Illinois, Wisconsin, Minnesota, Colorado..... | 1,173,421              | 1,188,614               | 940,730                |
| Total.....                                    | 7,041,426              | 6,673,306               | 6,006,607              |

### HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

| States  | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|---|------------------------|-------------------------|------------------------|
| Massachusetts, Connecticut.....               | 4,305                  | 6,222                   | 5,410                  |
| New York, New Jersey.....                     | 271,555                | 316,934                 | 380,391                |
| Pennsylvania.....                             | 417,088                | 519,882                 | 340,499                |
| Maryland, Virginia, West Virginia.....        | 236,549                | 285,142                 | 256,389                |
| Georgia, Kentucky.....                        | 29,617                 | 33,240                  | 27,957                 |
| Tennessee.....                                | 187,068                | 148,097                 | 171,409                |
| Alabama.....                                  | 701,886                | 659,965                 | 592,581                |
| Ohio.....                                     | 330,402                | 321,009                 | 327,570                |
| Indiana, Illinois.....                        | 58,844                 | 32,129                  | 26,281                 |
| Michigan.....                                 | 176,142                | 198,853                 | 178,781                |
| Wisconsin.....                                | 143,258                | 129,487                 | 140,548                |
| Minnesota, Missouri, Iowa, Colorado, Cal..... | 45,734                 | 74,850                  | 70,905                 |
| Total.....                                    | 2,602,448              | 2,725,810               | 2,518,721              |

### HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

| States                                     | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--|------------------------|-------------------------|------------------------|
| New York, New Jersey.....                  | 77,806                 | 71,569                  | 80,745                 |
| Pennsylvania.....                          | 38,176                 | 28,051                  | 62,707                 |
| Ohio.....                                  | 205,098                | 225,318                 | 212,567                |
| Alabama, Illinois, Michigan, Wis., Mo..... | 188,902                | 170,669                 | 251,209                |
| Total.....                                 | 509,982                | 505,597                 | 607,215                |

### HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

| States            | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|-------------------|------------------------|-------------------------|------------------------|
| New Jersey.....   | 3,607                  | 2,822                   | 7,629                  |
| Pennsylvania..... | 98,910                 | 47,749                  | 74,457                 |
| Virginia.....     | 2,147                  | 354                     | 0                      |
| Tennessee.....    | 1,643                  | 1,580                   | 1,213                  |
| Alabama.....      | 17,156                 | 41,724                  | 42,021                 |
| Ohio.....         | 75,451                 | 52,564                  | 72,316                 |
| Total.....        | 198,914                | 146,793                 | 197,636                |

### HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

| States   | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--|------------------------|-------------------------|------------------------|
| New York, New Jersey, Penna., Maryland, Virginia,<br>Alabama, Illinois, Colorado, Washington, Cal..... | 210,432                | 242,678                 | *237,228               |
| Total.....   | 210,432                | 242,678                 | *237,228               |

\*152,051 gross tons of ferro-manganese and 85,177 tons of spiegeleisen.

### HALF-YEARLY PRODUCTION OF OTHER GRADES.

| States   | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--|------------------------|-------------------------|------------------------|
| Conn., New York, New Jersey.....                                 | 3,388                  | 15,522                  | 8,076                  |
| Bessemer and low-phosphorus.....                                 | 8,803                  | 9,810                   | 9,431                  |
| Md., Va., West Va., Tenn., Ga., Ala.....                         | 42,164                 | 23,359                  | 17,009                 |
| Indiana, Ill., Mich., Wis., Minn., Mo.,<br>Col., Wash., Cal..... | 10,523                 | 84                      | 4,651                  |
| Total.....   | 38,551                 | *31,045                 | 3,361                  |
| Total.....   | 74,429                 | 17,739                  | 42,528                 |

\*Credit due to change in grade.

### PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1918.

| Grades                                | For sale. | For maker's<br>use. | Total<br>Gross tons. |
|---------------------------------------|-----------|---------------------|----------------------|
| Basic.....                            | 1,164,020 | 7,453,672           | 8,617,692            |
| Bessemer and low-phosphorus.....      | 799,482   | 5,207,125           | 6,006,607            |
| Foundry, including ferro-silicon..... | 2,488,412 | 60,309              | 2,518,721            |
| Malleable.....                        | 563,279   | 44,030              | 607,318              |
| Forge or mill.....                    | 80,442    | 117,194             | 197,636              |
| Ferro-manganese.....                  | 67,659    | 84,392              | 182,051              |
| Spiegeleisen.....                     | 68,549    | 16,626              | 85,177               |
| All other grades.....                 | 24,403    | 18,126              | 42,528               |
| Total.....                            | 8,225,245 | 13,001,445          | 18,227,730           |

## OBITUARY

### W. J. Keep

William J. Keep, for many years consulting engineer for the Michigan Stove Co., Detroit, and one of the best known writers of the country on foundry topics, died



W. J. KEEP

Monday, Sept. 30, at his home in Detroit following an accident. He was knocked to the pavement by either a street car or an automobile and succumbed a few hours later. Mr. Keep was born in June, 1842, at Oberlin, Ohio. He attended Oberlin College for the freshman and sophomore years and was graduated from Union College, Schenectady, N. Y., in 1865 with the degree of civil engineer. He worked in the shop of Fuller, Warren & Co., Troy, N. Y., in 1865; was employed by Hubbell & Bros., Buffalo stove manufacturers, from 1865 to 1868, and was with Fuller, Warren & Co.

from 1868 to 1875. From 1875 to 1884, he manufactured stoves at Troy on his own account. He was a member of the American Society of Mechanical Engineers, American Institute of Mining Engineers, the (British) Iron and Steel Institute, International Association for Testing Materials, American Foundrymen's Association and various other associations. In 1902 his book "Cast Iron" was published and is the best known product of his pen. In 1885, Mr. Keep brought out some results of his studies into the relation between the shrinkage of cast iron and the composition of a foundry mixture. Later, on the publication of Professor Turner's discovery that the condition of carbon depended upon the proportion of silicon, Mr. Keep demonstrated that shrinkage varied inversely as silicon. He thereupon devised a method and apparatus known as "Keep's Test" for the determination of shrinkage in cast iron, and in this way to regulate the cupola mixture. For this purpose he used a ½-in. test bar. He elaborated his method of testing after making many thousands of tests in the investigation of the relation between the chemical analysis of cast iron and its physical properties. The results were contributed to the transactions of the American Institute of Mining Engineers prior to 1894. As a member of the Testing Committee of the American Society of Mechanical Engineers Mr. Keep continued his extensive experiments to determine the physical properties of cast iron and the results are recorded in the Transactions of that society.

CHARLES GUSTAVUS ROEBLING, president of the John A. Roebling's Sons Co. of Trenton and Roebling, N. J., and of the New Jersey Wire Cloth Co., Trenton, and vice-president of the John A. Roebling's Sons Co., New York, died Oct. 5 at his home in Trenton, aged 69 years. Mr. Roebling was born in Trenton, graduated from Rensselaer Polytechnic Institute in 1871 and for a number of years was mechanical engineer of the John A. Roebling's Sons Co. With his brother, Washington Augustus Roebling, he had a large part in the completion and construction of the Brooklyn bridge, which was started by their father, John A. Roebling. He was also actively identified with many other engineering projects.

MAJ. HENRY CLAY EVANS, sales agent at 30 Church Street, New York for the Lorain Steel Co., died at his home, 50 Montgomery Place, Brooklyn, on Oct. 8 of

pneumonia, following an attack of influenza from which he thought he had fully recovered. His long connection with the steel business, dating from his association with Johnson & Co., Johnstown, Pa., and continuously with the organizations which grew out of it earned for him the title of dean of the selling forces of the United States Steel Corporation. He leaves a widow, a daughter and two sons.

GEORGE R. CASEY of the steel sales department of the Federal Export Corporation, 42 Broadway, New York, died Oct. 3 at the Post Graduate Hospital New York, of pneumonia. Mr. Casey was a native of Johnstown, Pa., and for a number of years was connected with the Cambria Steel Co. in that city. Later he was employed in the sales office of the Midvale Steel & Ordnance Co. at Philadelphia.

GEORGE E. PRICE, salesman in the Pittsburgh office of the Youngstown Sheet & Tube Co., died at Camp Lee, Virginia, Oct. 3 of pneumonia following an attack of influenza. Interment was at Youngstown, Ohio, his former home. Mr. Price entered Camp Lee as a private and was subsequently promoted to corporal and later to sergeant in a training brigade.

HARRY J. SHOEMAKER, Philadelphia, secretary of the Pennsylvania Manufacturers' Association since its organization, 1909, died Oct. 2 in his apartments in the Young Friends' Association Building, aged 63 years. He was senior member of the firm of Shoemaker & Satterthwaite, Doylestown, at the time of his death.

H. CLAY STIER, Pittsburgh, treasurer of the Railway & Industrial Engineering Co., Greensburg, Pa., died Oct. 2, through self-inflicted injury attributed to ill health. He was about 42 years of age.

JOHN F. OLTROGGE, vice-president of the F. Wesel Mfg. Co., Brooklyn, manufacturer of machinery, died at his home in West Islip, L. I., Sept. 30, at the age of 65 years.

NELSON F. SHUNK, prominent Bucyrus, Ohio, manufacturer, owning a half interest in the Shunk Plow Co. of that city, died Sept. 29 of apoplexy, aged 68 years.

LEANDER J. HOOVER, founder, president and general manager of the Hoover Steel Ball Co., Ann Arbor, Mich., died Sept. 23 at his home, aged 42.

### Rapidly Rebuilding Morgan Plant

WASHINGTON, Oct. 8.—The Ordnance Department took prompt steps to begin the work of rebuilding the T. N. T. plant at Morgan, N. J., wrecked last week by a disastrous explosion. Even before the fire was under control and the last explosion had endangered the lives of the officials who had hurried to the scene, the Department had awarded the contract for rebuilding to the T. A. Gillespie Sons & Co., operators of the destroyed plant. Laborers were at once mobilized and started for Morgan where a contractor's organization was already on the ground. This action was necessary because of the important part which the output of trinitrotoluol plays in our ammunition supply.

The erection of a T. N. T. plant at Giant, Cal., has also been authorized by the War Department. The estimated cost is \$1,438,000.

Two sulphuric acid plants are to be erected in Pennsylvania under the supervision of the Construction Division of the Army. The estimated cost for both plants is \$3,000,000. One plant will be located at Emporium while the other will be erected at Mt. Union.

The Perfection Metal Products Co., College Point, N. Y., recently organized to manufacture metal stampings, special tubular products, etc., has elected William C. Lange, an officer of the Empire Art Metal Co., as its president and Andrew J. Connell, also an officer of the Empire Art Metal Co., as secretary and treasurer. Associated with them is the pioneer manufacturer, John W. Rapp. The chief sales office will be located at College Point.



# United States Pig Iron Production—First Half of 1918

The American Iron and Steel Institute has issued its special statistical bulletin No. 3, which gives the production of all kinds of pig iron in this country for the first six months of the present year. In each of the three preceding six-month periods, the production had exceeded 19,000,000 tons, but for the first half of 1918, the total was only 18,227,730 tons. The production of charcoal pig iron for the six months was 173,394 tons compared with 180,235 tons in the first half of 1917 and 196,290 tons in the second half of 1917. The details of the half year's output are as follows:

## HALF-YEARLY OUTPUT OF PIG IRON BY STATES.

### HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON.

| States        | Blast furnaces.              |                |        | Production—Gross tons.<br>(Includes spiegeleisen, ferro-mang.,<br>ferro-silicon, ferro-phosphorus, etc.) |                         |                        |
|---------------|------------------------------|----------------|--------|--|-------------------------|------------------------|
|               | In blast<br>Dec. 31<br>1917. | June 30, 1918. | Total. | First half<br>of 1917.   | Second half<br>of 1917. | First half<br>of 1918. |
| Massachusetts | 1                            | 1              | 2      | 4,305  | 6,222                   | 5,470                  |
| Connecticut   | 2                            | 2              | 4      |  |                         |                        |
| New York      | 21                           | 24             | 45     | 1,118,482  | 1,299,045               | 1,339,472              |
| New Jersey    | 5                            | 4              | 9      |  |                         |                        |
| Pennsylvania  | 122                          | 137            | 259    | 7,790,514  | 7,749,214               | 7,121,903              |
| Maryland      | 15                           | 13             | 28     | 234,589  | 187,623                 | 174,408                |
| Virginia      | 34                           | 31             | 65     | 231,937  | 288,374                 | 263,676                |
| Alabama       | 1                            | 0              | 1      | 1,494,479  | 1,459,226               | 1,286,571              |
| Georgia       | 1                            | 0              | 1      |  |                         |                        |
| Tenn.         | 0                            | 0              | 0      |  |                         |                        |
| West Virginia | 3                            | 3              | 6      | 282,548  | 279,403                 | 264,151                |
| Kentucky      | 4                            | 5              | 9      |  |                         |                        |
| Mississippi   | 0                            | 0              | 0      |  |                         |                        |
| Tennessee     | 10                           | 12             | 22     | 201,296  | 168,655                 | 189,978                |
| Ohio          | 64                           | 71             | 135    | 4,269,708  | 4,248,895               | 4,059,603              |
| Illinois      | 17                           | 24             | 41     | 1,810,137  | 1,646,778               | 1,505,113              |
| Indiana       | 13                           | 15             | 28     | 1,200,122  | 1,457,381               | 1,402,667              |
| Michigan      | 12                           | 11             | 23     |  |                         |                        |
| Wisconsin     | 5                            | 4              | 9      | 392,864  | 345,677                 | 368,469                |
| Minnesota     | 3                            | 3              | 6      |  |                         |                        |
| Missouri      | 2                            | 2              | 4      |  |                         |                        |
| Iowa          | 0                            | 0              | 0      |  |                         |                        |
| Colorado      | 3                            | 4              | 7      | 227,254  | 226,488                 | 246,249                |
| Oregon        | 0                            | 0              | 0      |  |                         |                        |
| Washington    | 0                            | 1              | 1      |  |                         |                        |
| California    | 0                            | 0              | 0      |  |                         |                        |
| Total         | 339                          | 371            | 84     | 19,258,235   | 19,362,981              | 18,227,730             |

### HALF-YEARLY PRODUCTION OF COKE PIG IRON.\*

|               |     |     |     |            |            |            |
|---------------|-----|-----|-----|------------|------------|------------|
| New York      | 21  | 24  | 45  | 1,117,918  | 1,294,237  | 1,334,792  |
| New Jersey    | 4   | 4   | 8   |            |            |            |
| Pennsylvania  | 107 | 127 | 234 | 7,586,452  | 7,575,164  | 7,005,488  |
| Maryland      | 2   | 3   | 5   | 234,589    | 157,523    | 174,206    |
| Virginia      | 15  | 13  | 28  |            |            |            |
| Georgia       | 1   | 0   | 1   | 231,937    | 294,888    | 264,396    |
| Tenn.         | 0   | 0   | 0   |            |            |            |
| Alabama       | 32  | 30  | 62  | 1,475,063  | 1,438,778  | 1,273,905  |
| West Virginia | 3   | 3   | 6   |            |            |            |
| Kentucky      | 4   | 5   | 9   | 282,548    | 272,889    | 263,431    |
| Tennessee     | 9   | 11  | 20  | 200,874    | 166,294    | 189,852    |
| Ohio          | 64  | 71  | 135 | 4,269,708  | 4,248,895  | 4,059,603  |
| Illinois      | 17  | 24  | 41  | 1,810,137  | 1,646,778  | 1,506,113  |
| Indiana       | 13  | 15  | 28  |            |            |            |
| Michigan      | 3   | 3   | 6   | 1,263,426  | 1,474,980  | 1,430,080  |
| Wisconsin     | 4   | 3   | 7   |            |            |            |
| Minnesota     | 3   | 3   | 6   |            |            |            |
| Missouri      | 1   | 1   | 2   |            |            |            |
| Iowa          | 0   | 0   | 0   |            |            |            |
| Colorado      | 3   | 4   | 7   | 402,028    | 388,537    | 433,064    |
| Washington    | 0   | 1   | 1   |            |            |            |
| Oregon        | 0   | 0   | 0   |            |            |            |
| California    | 0   | 0   | 0   |            |            |            |
| Total         | 306 | 345 | 61  | 18,874,680 | 18,988,963 | 17,933,932 |

\*Includes ferro-alloys made with electricity.

### ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

|              |    |   |    |         |         |         |
|--------------|----|---|----|---------|---------|---------|
| New Jersey   | 1  | 0 | 1  |         |         |         |
| Pennsylvania | 14 | 9 | 23 | 203,320 | 177,728 | 120,404 |
| Total        | 15 | 9 | 24 | 203,320 | 177,728 | 120,404 |

### HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

|               |    |    |    |         |          |         |
|---------------|----|----|----|---------|----------|---------|
| Massachusetts | 1  | 1  | 2  |         |          |         |
| Connecticut   | 2  | 2  | 4  | 4,305   | 6,222    | 5,470   |
| New York      | 0  | 0  | 0  |         |          |         |
| Pennsylvania  | 1  | 1  | 2  | 1,306   | 1,130    | 691     |
| Maryland      | 0  | 0  | 0  |         |          |         |
| Virginia      | 0  | 0  | 0  |         |          |         |
| Alabama       | 2  | 1  | 3  | 19,410  | *20,545  | 12,866  |
| Georgia       | 0  | 0  | 0  |         |          |         |
| Tenn.         | 0  | 0  | 0  |         |          |         |
| West Virginia | 1  | 1  | 2  | 422     | 2,361    | 126     |
| Kentucky      | 0  | 0  | 0  |         |          |         |
| Mississippi   | 0  | 0  | 0  |         |          |         |
| Tennessee     | 9  | 8  | 17 | 124,618 | 133,633  | 124,209 |
| Ohio          | 1  | 1  | 2  | 30,168  | *32,396  | 30,032  |
| Illinois      | 1  | 1  | 2  |         |          |         |
| Indiana       | 1  | 1  | 2  |         |          |         |
| Michigan      | 1  | 1  | 2  |         |          |         |
| Wisconsin     | 1  | 1  | 2  |         |          |         |
| Minnesota     | 1  | 1  | 2  |         |          |         |
| Missouri      | 1  | 1  | 2  |         |          |         |
| Total         | 18 | 17 | 35 | 180,235 | *196,290 | 173,394 |

\*Includes a small tonnage made with charcoal and coke.

### TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

|             |     |     |    |     |            |            |            |
|-------------|-----|-----|----|-----|------------|------------|------------|
| Coke*       | 306 | 345 | 61 | 406 | 18,874,680 | 18,988,963 | 17,933,932 |
| Anthracite† | 15  | 9   | 5  | 14  | 203,320    | 177,728    | 120,404    |
| Charcoal‡   | 18  | 17  | 18 | 35  | 180,235    | 196,290    | 173,394    |
| Total       | 339 | 371 | 84 | 455 | 19,258,235 | 19,362,981 | 18,227,730 |

\*Includes ferro-alloys made with electricity.

†Includes mixed anthracite and coke pig iron.

‡Includes small tonnage made with charcoal and coke.

## HALF-YEARLY OUTPUT OF PIG IRON BY GRADES.

### HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

| States                                 | First half<br>of 1917. | Second half<br>of 1917. | First half<br>of 1918. |
|--|------------------------|-------------------------|------------------------|
| New York, New Jersey                   | 535,286                | 627,367                 | 658,750                |
| Pennsylvania—Allegheny County          | 1,797,309              | 1,901,228               | 1,694,024              |
| —Other counties                        | 2,330,237              | 2,320,621               | 2,157,676              |
| Virginia, Alabama, Kentucky            | 770,667                | 748,795                 | 625,019                |
| Ohio                                   | 1,412,324              | 1,575,056               | 1,544,630              |
| Indiana, Illinois                      | 1,466,677              | 1,610,138               | 1,617,829              |
| Michigan, Minn., Missouri, Cal., Wash. | 308,104                | 267,853                 | 319,764                |
| Total                                  | 8,620,804              | 9,051,058               | 8,617,692              |

### HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

|  |           |           |           |
|--|-----------|-----------|-----------|
| New York, New Jersey                     | 234,345   | 254,484   | 193,063   |
| Pennsylvania                             | 2,943,671 | 2,741,346 | 2,603,099 |
| Maryland                                 | 214,652   | 175,916   | 170,153   |
| West Virginia, Kentucky, Tenn., Ala.     | 249,427   | 238,082   | 201,726   |
| Ohio                                     | 2,235,910 | 2,074,864 | 1,897,869 |
| Illinois, Wisconsin, Minnesota, Colorado | 1,173,421 | 1,188,614 | 940,730   |
| Total                                    | 7,041,426 | 6,673,306 | 6,006,607 |

### HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

|   |           |           |           |
|---|-----------|-----------|-----------|
| Massachusetts, Connecticut                | 4,305     | 6,222     | 5,410     |
| New York, New Jersey                      | 271,555   | 316,934   | 380,391   |
| Pennsylvania                              | 417,088   | 519,882   | 340,499   |
| Maryland, Virginia, West Virginia         | 236,549   | 283,142   | 256,399   |
| Georgia, Kentucky                         | 29,617    | 33,240    | 27,957    |
| Tennessee                                 | 187,068   | 148,097   | 171,409   |
| Alabama                                   | 701,886   | 659,965   | 592,581   |
| Ohio                                      | 330,402   | 321,009   | 327,570   |
| Indiana, Illinois                         | 58,844    | 32,129    | 26,281    |
| Michigan                                  | 176,142   | 198,853   | 178,781   |
| Wisconsin                                 | 143,258   | 129,487   | 140,548   |
| Minnesota, Missouri, Iowa, Colorado, Cal. | 45,734    | 74,850    | 79,905    |
| Total                                     | 2,602,448 | 2,725,810 | 2,518,721 |

### HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

|  |         |         |         |
|--|---------|---------|---------|
| New York, New Jersey                   | 77,806  | 71,569  | 80,745  |
| Pennsylvania                           | 38,176  | 38,051  | 62,707  |
| Ohio                                   | 205,098 | 225,318 | 212,567 |
| Alabama, Illinois, Michigan, Wis., Mo. | 188,902 | 170,659 | 251,209 |
| Total                                  | 509,982 | 505,597 | 607,318 |

### HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

|              |         |         |         |
|--------------|---------|---------|---------|
| New Jersey   | 3,607   | 2,822   | 7,629   |
| Pennsylvania | 98,910  | 47,749  | 74,457  |
| Virginia     | 2,147   | 354     | 0       |
| Tennessee    | 1,643   | 1,580   | 1,313   |
| Alabama      | 17,156  | 41,724  | 42,021  |
| Ohio         | 75,451  | 52,564  | 72,316  |
| Total        | 198,914 | 146,793 | 197,636 |

### HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

|   |         |         |          |
|---|---------|---------|----------|
| New York, New Jersey, Penna., Maryland, Virginia, Alabama, Illinois, Colorado, Washington, Cal. | 210,432 | 242,678 | *237,228 |
| Total   | 210,432 | 242,678 | *237,228 |

\*152,051 gross tons of ferro-manganese and 85,177 tons of spiegeleisen.

### HALF-YEARLY PRODUCTION OF OTHER GRADES.

|  |        |         |        |
|--|--------|---------|--------|
| Conn., New York, New Jersey                              | 3,388  | 15,522  | 8,076  |
| Bessemer and low-phosphorus                              | 8,803  | 9,819   | 9,431  |
| Md., Va., West Va., Tenn., Ga., Ala.                     | 43,194 | 23,359  | 17,009 |
| Ohio   | 10,523 | 84      | 4,651  |
| Indiana, Ill., Mich., Wis., Minn. Mo., Cal., Wash., Cal. | 38,551 | *31,045 | 3,361  |
| Total  | 74,429 | 17,739  | 42,528 |

\*Credit: due to change in grade.

### PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1918.

| Grade                            | For sale. | For maker's use. | Total Gross Tons. |
|----------------------------------|-----------|------------------|-------------------|
| Basis                            | 1,164,020 | 7,453,672        | 8,617,692         |
| Bessemer and low-phosphorus      | 799,482   | 5,207,125        | 6,006,607         |
| Foundry, including ferro-silicon | 2,458,412 | 60,309           | 2,518,721         |
| Malleable                        | 563,279   | 44,039           | 607,318           |
| Forge or mill                    | 80,442    | 117,194          | 197,636           |
| Ferro-manganese                  | 67,659    | 84,392           | 152,051           |
| Spiegeleisen                     | 68,549    | 16,628           | 85,177            |
| All other grades                 | 24,402    | 18,126           | 42,528            |
| Total                            | 5,226,245 | 13,001,485       | 18,227,730        |

# President May Organize New Labor Board

Duties of New Body Not Announced, but  
Outline Given in a Letter from Secretary Wilson  
—Woman Labor Questions Causing Trouble

WASHINGTON, Oct. 8.—President Wilson is at work on the project for another "labor board." Just what the duties of this newest commission are to be has not definitely been announced. There are already in existence a considerable series of labor boards and wage adjustment commissions which have been handling labor controversies with more or less success. The new board, it seems, is scheduled to co-ordinate their labors and to end the conflict of jurisdictions. Whether it will also attempt to avoid the present conflicts between Federal and State labor administrators is not made known.

In fact, little actual detail is so far available. The President's plan appears to have been disclosed somewhat prematurely by Secretary of Labor Wilson. The latter now refers all questioners to the President. Secretary Wilson's disclosure came in a letter which he wrote to Fuel Administrator Garfield after the latter had declined to consider a demand for increased wages in the anthracite mines. Secretary Wilson succeeded in inducing Dr. Garfield to withdraw his veto and to receive Secretary Wilson—himself a former official of the United Mine Workers of America—and four mine operators and four mine workers for a conference on the subject.

## Secretary Wilson Writes Dr. Garfield

In that letter Secretary Wilson wrote to Dr. Garfield:

"We have built up within a week or so, as a result of the desire of the President to secure more stable conditions in industry, a board the title of which has not yet been decided upon. I presume it will be looked upon and considered possibly as a general wage board. It is a board that is to be composed of two representatives from each of the wage adjustment boards that have been created by the Federal Government. The purpose of that board is to review the proposed contracts or proposed wage adjustments that may be arrived at by any one of the adjustment boards, so that when they are finally announced they will not be of such a character that they will disturb the labor conditions under the jurisdiction of the other boards."

This, however, is all that so far has been made public concerning the proposed board.

A survey of the boards already constituted to take care of these labor difficulties reveals an imposing array of commissions covering apparently every possible kind of labor dispute. The principal organization of this kind already existing is the National War Labor Board headed by former President Taft and Frank P. Walsh as joint chairmen. This was formed by presidential proclamation to settle industrial disputes that threaten delay of war material production. It is not intended to act, however, in cases that are within the jurisdiction of regularly constituted Government boards of arbitration and conciliation operating in special fields, and reserves the right to decide what cases are of sufficient importance to demand its attention.

A second such organization is the Bureau of Conciliation and Mediation in the Department of Labor, organized to supply mediators in industrial disputes. If a mediator of this organization is unable to bring disputants together, he may report the facts and recommend action by the War Labor Board.

## Wages at Shipyards

Then there is the Shipbuilding Labor Adjustment Board, more commonly known as the Macy Board. This board deals exclusively with adjustments of wages, hours and conditions of labor in the construction or repair of those shipbuilding plants for which funds are being provided by the United States Shipping Board Emergency Fleet Corporation or the Navy, and in the

construction or repair of ships which is carried on under contract with the Emergency Fleet Corporation or the Navy, exclusive of work being done in the Navy Yards. The board has its own examiners in all districts where shipbuilding is carried on. In yards that do not deal directly with the union shop, committees are provided to consider grievances.

The National Adjustment Commission handles longshoremen's disputes; the Railway Board of Adjustment No. 1 takes care of cases arising in engine, train and yard service; Railway Board of Adjustment No. 2 handles cases arising in railway shop matters.

The Cantonment Adjustment Commission functions in cantonments and other Army construction work; the Harness and Saddlery Commission adjusts labor disputes arising in the manufacture of harness and leather goods for the Army, while the Anthracite Conciliation Board handles labor disputes arising in the mining of anthracite coal.

Besides these agencies there is L. C. Marshall, Director of the Industrial Relations Group, who assists employers and workers in referring disputes to the proper Government agencies for mediation or arbitration. The functions of the Industrial Relations Group are to offer counsel and advice along the lines of scientific employment and to administer draft deferments, transfers and similar matters relating to the handling of the personnel in shipyards. The group also offers expert assistance in all matters affecting the health and physical welfare of the workers in the shipyards. The Safety Engineering Section gives close attention to the matter of the safety of the workmen engaged in building ships and ship material. It is the function of the Education and Training Section to inaugurate training centers throughout the country where men may be trained for shipyard work, and men already in the shipyards may be given more advanced training. The Labor Administration Section is a department for advice and counsel in the proper handling of disputes between employer and worker. While not organized for the purpose of arbitration, this section is often able to counsel those interested in such a manner as to avoid loss of time through strikes or lockouts.

## Hearing at Minneapolis

Joint Chairmen Taft and Walsh of the National War Labor Board have left for Minneapolis, Minn., to conduct a hearing on Thursday in the controversy between the employees and management of the Minneapolis Steel & Machinery Co. In this controversy, the jurisdiction of the War Labor Board is questioned by the management on the ground that the State Board of Arbitration has prior jurisdiction in the case, and that its offices have not been invoked. The workers contest this position on the ground that the terms of a proclamation governing industrial relations in Minnesota issued by Governor Burnquist, under which all controversies are referred to the State Board, come in conflict with the principles and policies proclaimed by President Wilson as the basis for decisions of the National War Labor Board. Argument on the question of jurisdiction will be heard in Minneapolis, and, if jurisdiction is assumed, hearing may be begun into the merits of the case, as well as of other Minneapolis controversies which are before the War Labor Board.

The War Labor Board has handed down decisions in the case of the employees of the Boston Elevated Co. and the Rhode Island Co. In both it fixed minimum wages of motormen and conductors at 43c. per hour and of brakemen at 40c. per hour.

Apparently replying to the contention that higher wages will cause a loss in operation, the board put the following paragraph into its award in the Boston case as a precedent for similar questions:

"If the company needs coal or steel in the operation of its road, it must pay the war prices for these commodities or go without. Similarly, if it needs labor, it must also pay a price commensurate with the present exigency, a price that will enable its employees to meet their greatly increased expenses. In justice the public should pay an adequate war compensation for a service that cannot be rendered for war prices."

#### Questions in Woman's Work

The woman labor question is still causing much trouble in Washington. Miss Nina Van Kleeck, chief of the Women in Industry Service, however, has won out in her battle with J. B. Densmore, chief of the United States Employment Service. The two women who are being added to the community labor boards throughout the country are to have the right to vote on all questions, including those involving male labor. Secretary of Labor Wilson has overruled Mr. Densmore's plan to limit their voting to questions of woman labor.

"The demands of war necessitate a larger introduction of women into industry than has hitherto been attempted in this country," says the announcement of Secretary Wilson. "The policy of the Employment Service in having this great change in the national life supervised by women equally with men is a guarantee that the process will be carefully carried out, and that no woman will be allowed to take work for which she is not physically fitted or under conditions not suitable for her employment."

In the same way two women, one to represent employers and one to represent labor, are to be added to each State Advisory Board of the Employment Service, bringing the total membership of each of these boards from five to seven. Hitherto the State Advisory Boards have been composed of the state director of the Employment Service as chairman, two representatives of management and two of labor.

Miss Van Kleeck has also forecast a new feature in handling the question of women's wages by suggesting that they must be treated as heads of families and not as skilled individuals. This would immediately cause a complete revision of all woman labor schedules. In presenting this view to a conference of State and Federal labor officials in Washington Miss Van Kleeck said:

"The Wage Adjustment Boards have no representatives of women. The great problems have been those of men's wages, and women's wages have not received the attention they should. The public has considered women's wages on the basis of the maintenance of the individual woman. The Women's Trade Union League has gone on record for the consideration of women's wages on the family basis. We know that many women who work have others dependent upon them, and we should think now in terms of the family."

That conference adopted resolutions demanding that no change be made to lower present labor standards.

W. L. C.

#### Labor Conditions on Pacific Coast

SAN FRANCISCO, Oct. 1.—Disregarding the request of the Wage Adjustment Board that workers in the Pacific Coast Shipyards work eight hours on Saturdays in accordance with existing agreements until the Board could make known its award, President M. A. McEarcheran of the Pacific District Council of Boilermakers announced on Sept. 30 that none of its members would work next Saturday afternoon and that they would work only half a day on Saturdays thereafter. The District Council which is now in session in Oakland, will remain in session until the award of the Wage Adjustment Board is announced. Coincident with the meeting of representatives of the Boilermakers, the Pacific Coast District Metal Trades Council, representing more than 150,000 shipyard workers, has begun holding sessions at the Labor Temple in San Francisco to await the award of the board, and will remain in session until final action is taken by all the local iron trade unions.

As if in answer to this stand of the workers, the announcement is made by District Officer Samuel Spring of the Emergency Fleet Corporation, while acting as

chairman of a meeting of officials of the corporation, the shipbuilders, the U. S. Shipping Commissioner, Adjutant General J. J. Borree and members of the local and district draft boards, that all men less than 31 years of age within the draft who are employed in shipyards are to be denied further exemption and sent back to the draft boards unless it can be shown that their services are absolutely indispensable. The managements of the shipyards plan carefully to catalog their employees and determine which are essential. Mr. Spring pointed out the demand for young men capable of fighting in the ranks presented a vexing problem and that it might be necessary to call to the colors every young man in the shipyards whose services could be dispensed with or who could be replaced by an older man. It is impossible to estimate the number who will lose deferred classification by this plan. Some calculate the total would reach 20,000.

Acting somewhat along this same line, steps were taken last week to put the Oakland factories on a war basis. At the request of the War Industries Board a committee was organized by the Oakland Chamber of Commerce, and reports on machinery, equipment and non-war products are to be made to the War Industries Board.

The Bethlehem Shipbuilding Co., San Francisco, has awarded a contract for \$2,500,000 to the Foundation Co., New York, for the construction of the first unit of the new shipbuilding plant of the Bethlehem Shipbuilding Co., at Hunter's Point, San Francisco. Charles M. Schwab and associates, it is understood, are to spend between \$7,000,000 and \$9,000,000 on this new plant. The proposition has been under consideration for some time and the letting of the contract is the first definite announcement that the plant is to be built.

#### Bridgeport Local Board Completed

The manufacturers of Bridgeport who were included within the recent award of the National War Labor Board, met in that city, Oct. 3, and selected three men to represent them on the local board of mediation and conciliation to be formed under the terms of the award. Those who will represent the employers are Jarvis Williams, Jr., manager of the ammunition plants of the Remington Arms Union Metallic Cartridge Co.; Willis F. Hobbs, president Bridgeport Hardware Mfg. Co., and Guy P. Miller, treasurer Bridgeport Brass Co. and American Tube & Stamping Co. Representing the employees will be Samuel Lavit, business agent Local No. 55, International Association of Machinists; David Clydesdale, employed by the American & British Mfg. Co., and Patrick Scollins, employed by the Remington Arms U. M. C. Co.

The board will begin its work as soon as the chairman, who is to be selected by the Secretary of War, arrives in the city. It is reported that Judge George Gray, Wilmington, Del., has been named by acting Secretary of War Crowell and has accepted the position. He formerly represented Delaware in the United States Senate and is noted as a legislator, jurist and an arbitrator. He was on the commission which arranged the terms of peace between the United States and Spain. He was at the head of the commission which settled the anthracite coal strike about 15 years ago and has served on the arbitration boards in several important controversies. Until two years ago, he was Federal judge of the district comprising Delaware, New Jersey and part of Pennsylvania. It is believed that his appointment will be acceptable to both sides.

Last Thursday the examiner, Alpheus Winter, issued several additional rulings. These cover principally the inclusion of piece workers under the award and the extension of the time for retroactive payments to Nov. 1. There is considerable resentment at the inclusion of piece workers under the award, as no mention was made in the hearings or in the award of this class of workers. It will mean the virtual doubling of the money to be paid under the retroactive section of the award and further increases the earnings of that portion of the working force whose high earnings were one of the fundamental causes of the original controversy.



# Machinery Markets and News of the Works

## SHOPS ALL ON WAR WORK

### The Government Dominates All Buying

#### Midvale Issues List of 82 Tools—Grenade Contracts Let at Chicago—Large Ordnance Department Contracts for Lathes

Very heavy purchases of machine tools from sources at Washington are now being made in the Philadelphia market. Appropriations have recently been made for the Rock Island Arsenal of \$833,500, and it is understood that three lists have been compiled covering its requirements, one for \$200,000 worth of tools. The Frankford Arsenal at Philadelphia has also been granted an appropriation of \$1,000,000 for improvements, and it is expected that \$500,000 will be spent for equipment. A new department will be established there for the manufacture of cartridge cases.

The Midvale Steel & Ordnance Co., Philadelphia, has issued a list of 82 miscellaneous machine tools for its 16-in. howitzer plant now under construction at Nicetown. The Navy Department has placed orders for \$192,000 worth of boring and turning lathes for its new Subhead No. 4 gun plant at the Washington Navy Yard. The Ordnance Department is buying heavily for plants engaged in the manufacture of gun boring and turning lathes, both for the Neville Island gun plant and the gun relining plant in France. According to a report from Cincinnati the Procurement Division, Ordnance Department, is understood to be gathering information from lathe makers looking toward

the production of about 4000 20-in. and 24-in. lathes. A local builder has accepted an order for 100 36-in. lathes and more orders for this size may follow within a short time.

All plants able to produce essential machine tools, special machines and other supplies, are very busy in response to orders from manufacturers with which the Government is now placing its business. This development is particularly true with machinery builders in New England.

Large contracts for grenades have been placed in the Chicago district. The International Harvester Co. will manufacture 5,000,000 hand and rifle grenades, and also 750,000 6-in. shells.

The Standard Sanitary Mfg. Co., Pittsburgh and Louisville, received a contract for finishing operations on 1,000,000 155-mm. shells.

The Government is placing orders for 40,000 Military four-wheel tractors for hauling artillery.

The production of Liberty motors in Detroit and nearby has increased rapidly, and it is estimated that war contracts in that territory have passed the \$1,000,000,000 mark. The Willys-Overland Co. has ordered over \$300,000 worth of lathes, grinders, millers and special sensitive drills for work on 8 and 12-cylinder Liberty motors for its Toledo and Elyria plants.

The Savage Arms Corporation, Utica, will issue a list of tools for making Colt's automatic pistols and it is reported that the Lanston Monotype Machine Co. and the S-S-E Co., both of Philadelphia, will also engage in this work, buying presumably to be done through the Ordnance Department.

## New York

NEW YORK, Oct. 8.

Although there continues to be a fairly good demand in this territory for machine tools in small lots, no large buying has developed during the past week. The Savage Arms Corporation, Utica, N. Y., will have a large list shortly for the manufacture of Colt's automatic pistols. There is a possibility, however, of some of this business being placed by the Ordnance Department in Washington. The American Can Co. has bought a number of machines for the expansion of its output of booster cases at Edgewater, N. J. The Watervliet Arsenal, Watervliet, N. Y., continues to buy. Orders were also placed during the week by the Locomobile Co. of America, Bridgeport, Conn., for tools which were reserved a few weeks ago.

There have been a number of price advances, sensitive drills having gone up 10 per cent, while a well-known lathe manufacturer has advanced his entire line from 10 to 15 per cent and another manufacturer of high-speed drilling machines and other tools has advanced prices about 15 per cent.

The crane market continues very quiet, and builders are having great difficulty in obtaining regular shipments of steel. In some plants, output has been cut down to about 75 per cent of capacity because of irregular deliveries of plates and shapes. The Gilbert Grant Co., New York, has taken an order for four jib cranes from the Air Nitrates Corporation, New York. The Champion Engineering Co., Kenton, Ohio, has taken an order for two 10-cranes overhead cranes from the American International Shipbuilding Corporation for the Hog Island shipyard.

The new pattern works at the plant of the Sprague Electric Works of the General Electric Co., Bloomfield, N. J., will be two stories, 60 x 160 ft.

The Federal Dry Dock & Repair Co., Hoboken, N. J., has been incorporated with a capital of \$3,000,000 by William W. Corlett, Kenneth B. Halstead and Edward F. Briggs.

The Hyatt Roller Bearing Division of the United Motors Corporation, Harrison, N. J., is having preliminary plans drawn for a proposed two-story addition.

The Upson-Walton Co. of New York, 462 Riverside Avenue, Newark, N. J., manufacturer of wire rope, etc., has filed plans for a two story addition, 55 x 137 ft., to cost \$40,000.

De Camp & Sloan, Inc., Newark, N. J., operating a machine shop at 163-170 Pennington Avenue, has increased its capital from \$100,000 to \$200,000.

The World Typewriter Co., Newark, N. J., has been incorporated with a capital of \$125,000 to manufacture typewriters. D. F. Burnett, Leonard A. Duncan and E. C. Grosch, Newark, are the incorporators.

The F. S. Machine Specialties, Inc., West Orange, N. J., has been incorporated with a capital of \$25,000 by Henry W. Schulman, West Orange, and Jacob Doduke, to manufacture tools and machinery.

The Bridgeton Gas Light Co., Bridgeton, N. J., has been granted permission to issue capital stock for \$38,000 for extensions and betterments.

The Board of Water Commissioners, Perth Amboy, N. J., is planning improvements and extension in its pumping plant at Runyon to cost about \$60,000. The work will include the installation of two new pumping units, engines and auxiliary equipment. S. J. Mason is superintendent.

The Paterson Machine Co., Paterson, N. J., has been incorporated with a capital of \$125,000 by Charles B. Vaughan, George M. Rusling and Van Dyck Rusling to manufacture tools and machinery.

The War Department, Washington, has approved an appropriation of \$110,000 for the construction of a new proving-ground, with buildings, shops, etc., at Elizabeth, N. J. A site of 43 acres has been acquired.

The Broadway Tool & Machine Co., Elizabeth, N. J., has been incorporated with a capital of \$25,000 by Louis Blitzky and Emil Votter.

The Penguin Co., Rutherford, N. J., has been incorporated with a capital of \$100,000 by A. P. Nelson, James A. Burke and William Hughes to build ships.

Thomas O'Connor, operating a shipbuilding works at Port Jefferson, N. Y., for Government vessels, has acquired a portion of the waterfront property on Flushing Bay, known as "Harry Hill," from the Degnon Realty & Terminal Improvement Co. The new owner, associated with Alexander McWhirter, 45 East Forty-second Street, New York, will establish a plant for the construction of 110-ft. barges. It is understood the works at Port Jefferson will be given up.

The Poughkeepsie Cutlery Works, Poughkeepsie, N. Y., has been incorporated with a capital of \$50,000 by J. D. Sharman, W. E. Eppert and A. C. Dow, Poughkeepsie.

The Elite Machine & Tool Works, New York, has been incorporated with a capital of \$10,000 by P. and S. Director and N. Rosovsky, 823 Manida Street, to manufacture machinery and tools.

The Soss Mfg. Co., 435 Atlantic Avenue, Brooklyn, manufacturer of hardware specialties, has awarded a contract to the William Kennedy Construction Co., 215 Montague Street, for the construction of a three-story plant, 50 x 130 ft., at Bergen Street and Grand Avenue, to cost \$35,000.

The Christiana Machine Co., Church Street, New York, it is reported, has disposed of its factory site property at Bodine Street and Richmond Terrace, West New Brighton, S. I.

The Morse Dry Dock & Repair Co., foot of Fifty-sixth Street, Brooklyn, has had plans prepared for a one-story boiler plant, 35 x 65 ft.

Koster & Chudnoff, Inc., New York, has been incorporated with a capital of \$20,000 by W. Roester, J. Chudnoff and J. T. Crane, 2 Rector Street, to manufacture marine and plumbing fixtures.

Dreyfus Brothers, Inc., 29 Broadway, New York, dealer in iron and steel products, has increased its capital from \$10,000 to \$50,000.

The War Department, Washington, has approved an appropriation of \$128,650 for the construction of repair shops and other buildings for the utilities detachment at Camp Upton, N. Y.

The Hot Flo Faucet Corporation, New York, has been incorporated with a capital of \$50,000 by S. O. Simons, H. Frantzen and H. Remington, 302 West 102 Street.

The New York Fire Engine Works, New York, has been incorporated with a capital of \$100,000 by C. Zimmerman, L. Lowy and M. D. Billitzer, 237 Fourth Avenue.

The Miller Production Co., New York, has been incorporated with a capital of \$100,000 to manufacture aeroplane parts, carburetors, etc. H. A. Miller, W. R. Brookins and P. B. Brown, 35 West Sixty-fourth Street, are the incorporators.

The American Cooperage Co., 235 Russell Street, Brooklyn, has purchased about 60 lots at Ninth, Eleventh, Twelfth and Pierce streets, and Jackson Avenue, Long Island City, as site for a plant, which, it is understood, will cover only part of the property.

The Clark Martin Shipbuilding Co., New York, has been incorporated with a capital of \$100,000 by G. W. Clark, A. M. and M. H. Salzer, 925 St. Marks Avenue, Brooklyn.

The Liberty Starters Corporation, New York, has been incorporated with an active capital of \$315,000 by R. H. Eggleston, D. G. Maynard and R. H. Ison, 120 Broadway, to manufacture motor-starting equipment, etc.

The E. B. Estes & Son Mfg. Corporation, New York, has been incorporated with a capital of \$100,000 by W. F. Davis, J. F. Crater and O. M. Barnes, 115 Broadway, to manufacture surgeons' implements, etc.

The Columbia Machine Works & Malleable Iron Co., 269 Chestnut Street, Brooklyn, is building a foundry addition to its plant to cost \$60,000.

The Raymond Releasing Device Co., New York, has been incorporated with a capital of \$12,500 by G. E. Hayes, O. J. McGowan and J. A. Barrett, 42 Broadway to manufacture a releasing device for lowering and detaching boats.

The Watercraft Construction Co., New York, has been incorporated with a capital of \$50,000 by A. Lennon, F. B. Wood and W. J. Doyle, 233 Broadway.

The Roselle Machine & Tool Co., Roselle, N. J., has been incorporated with a capital of \$50,000 by Martin Czarny and Frank Tracy, 551 East Second Street.

The Remington Arms Co., Ilion, N. Y., has filed plans for a one-story boiler plant, 38 x 65 feet. It has also awarded contract to R. Richards & Sons, Utica, N. Y., for a one-story addition to its kiln works, 70 x 190 ft., to cost \$25,000.

The Dubois Ordnance Co., Albany, N. Y., has been incorporated with a capital of \$250,000 by F. E. Fitch, A. Barvoets and G. C. Dubois.

The Knickerbocker Motors, Inc., Poughkeepsie, N. Y., has awarded contract to Edgar V. Anderson, Market Street, Poughkeepsie, for a one-story addition, 60 x 175 ft., to cost \$40,000.

Theodore F. Hussa, 50 Church Street, New York, is in the market for several 8-ft. gage 10-ton locomotive cranes.

The Boston & Maine Railroad Co., A. B. Corthell, chief engineer, North Station, Boston, has let contract for erection of an engine-house, a boiler-house and an office building at Rotterdam Junction, N. Y., to cost \$75,000.

## Buffalo

BUFFALO, Oct. 3.

The Republic Carbon Co., Niagara Falls, N. Y., will erect four factory buildings on Sugar Street, 80 x 340 ft., 90 x 144 ft. and 48 x 100 ft., all one story, and 32 x 80 ft., four stories. Bids are being taken by A. D. Smith, chief engineer, 912 Ellicott Square Building, Buffalo.

The Bridgeford Tool & Machine Co., Rochester, A. W. Ingle, president, has awarded general contract for the construction of a three-story addition, 100 x 170 ft.

The King Sewing Machine Co., Buffalo, has drawn plans and is letting contracts for the erection of an addition, 34 x 111 ft., to its plant at Welland Avenue and the Lackawanna Railroad.

The New York Central Railroad Co. has awarded contract to the Robert W. Smith Corporation, 30 Church Street, New York, for erecting car repair shops at Belle Isle, N. Y., to cost \$60,000. J. W. Pfau, Grand Central Terminal, New York, is the architect and engineer.

The McKinnon Chain Co., Buffalo, will build an extensive addition to its plant at Fremont Street, Fillmore Avenue and the Erie Railroad, Tonawanda, N. Y.

The Aluminum Castings Co., Roger C. Adams, manager, Buffalo, has let contract for the erection of a trimming building, 80 x 100 ft., at its plant at Elmwood Avenue and the Erie Railroad.

The Willys-Morrow Co., Elmira, N. Y., John N. Willys, president, is taking bids for a reclaiming building, 58 x 125 ft., one story, to cost \$15,000.

The New York Car Wheel Co., 15 Forest Avenue, Buffalo, has filed plans for extensions in its foundry to cost about \$8,000. M. R. Cooley is president.

The Sterling Engine Co., 1250 Niagara Street, Buffalo, is arranging plans for the discontinuance of the manufacture of motors for pleasure cars and boats, and will devote the entire capacity of its plant on Niagara Street to the production of high-power engines for the Government. The change will be complete by Jan. 1. The company has received a contract from the Government for the manufacture of 200 and 300-hp. internal combustion engines for use in tractors and caterpillar machines. The plant will be extended to facilitate speed in production, and additions to the works are now under way. It is expected to build other extensions. C. A. Criqui is president.

The Mayer & Clarkson Co., Ellicott Square, Buffalo, manufacturer of hardware supplies, has filed plans for a plant on Comet Avenue, near Delaware Avenue, for the manufacture of cold-rolled shafting cold-rolled steel, etc. Alfred L. Mayer is president.

The American Car & Foundry Co., 370 Babcock Street, Buffalo, is planning an addition to its Babcock Street car construction and repair shops. It has filed plans for alterations in its foundry at 80 Metcalfe Street, to cost about \$4,000.

G. Elias & Brother, Buffalo, have filed plans for a boiler plant at their wood-working plant at 965 Elk Street.

The Public Service Commission, Second District, has approved the proposed plan for the merger of the Hydraulic Power Co. and the Niagara Falls Power Co., Niagara Falls, N. Y., with a total capitalization of \$62,000,000. The immediate plans of the combined organization provide for the construction of a hydroelectric generating plant in the

Niagara Gorge to cost about \$16,000,000, making a large increase in electric power available for the industries in this vicinity, in addition to the estimated 100,000 hp. available through the merger. The initial installation will consist of two 33,000-hp. generating units. With proposed construction of diversion channels for water, it is planned to increase the present power generation in the district covered by the two companies from 255,000 hp. to 400,000 hp. The combined company will be known as the Niagara Falls Power Co. Paul A. Schoellkopf will be vice-president and general manager.

The Metal & Alloy Specialty Co., 25 Illinois Street, Buffalo, has received permission from the City Council to build a new plant on Marion Avenue, near the New York Central Railroad Black Rock cutoff. The structure will be two stories, of steel and reinforced concrete, 60 x 100 ft., and will be equipped for the manufacture of airplane parts of aluminum, brass and alloyed metals. T. S. Hemenway is president, and Elmer Rae vice-president and general manager. The plant will be used as an extension to its Illinois Street works.

The Louis B. Harrison Shipyards, Athens, N. Y., has been incorporated with a capital of \$50,000 by Louis B. Harrison, J. F. McKinney and M. H. Reiss.

The Bridgeford Machine Tool Works, Winton Road North, Rochester, N. Y., has awarded contract to the Crowell, Lundoff & Little Co., Liberty Building, Rochester, for a three-story addition, 100 x 170 ft.

Henry Wray & Son, 193 Mill Street, Rochester, N. Y., manufacturers of brass castings, are building a three-story addition to their foundry.

The foundry building to be erected by the Hessler Foundry & Mfg. Co., Mitchell Street, Oswego, N. Y., will be 60 x 260 ft., of concrete and steel. Bids are now being taken. It is estimated to cost \$40,000.

A power house, 36 x 50 ft., will be erected by the Douglas Packing Co., Fairport, N. Y.

## New England

BOSTON, Oct. 7.

There is almost no plant expansion in prospect, and local demands for machinery and equipment, otherwise than small tools, are very limited. All plants that can produce essential machine tools and other supplies are very busy in response to orders from the sections in which the Government is now placing its business.

Some improvement is noted in the labor turnover in cities in which the United States Employment Service has become well organized and has secured the active co-operation of employers. In other places the labor situation is not improved, and the shortage is even more pronounced. The training school movement is making some progress, but is held back owing to the difficulty in securing competent instructors. The work of the district ordnance offices in assisting in the dilution of labor appears to be in competent hands, and definite results of their campaigns to enlist the labor of women, old men and minors in munition plants can now be discerned.

While various labor controversies appear to be in a quiescent condition, there is much stirring underneath, and it is by no means certain that the recent decisions of the National War Labor Board will mean industrial peace in this section. Manufacturers are apprehensive that the various decisions and interpretations of those decisions, as exemplified in the Bridgeport case, mean not only an attack upon executive control but also a certain loss of production. Not only is the morale of the employers being affected, but also in many cases their financial standing is being jeopardized. This is particularly true in the case of those who are sub-contractors and can obtain no promise of adjustment of their flat-rate contracts.

The Acme Wire Co., New Haven, Conn., has awarded to the Hayes Building Co., a contract for an addition, 38 x 60 ft., two stories.

The Hartford Special Machinery Co., Hartford, Conn., has issued 1190 additional shares of stock, making the outstanding capitalization \$178,500.

Landers, Frary & Clark, New Britain, Conn., have secured a permit to build an addition, 80 x 108 ft., one story.

The Connecticut Ship & Construction Co., New Haven, has been incorporated with authorized capital stock of \$100,000 by Frank H. Andrews, Albert H. Powers and Matthew A. Reynolds.

The Eastern Malleable Iron Works, Vulcan Iron Works branch, New Britain, Conn., has purchased property adjoining its present tract, to be used for future development.

The Main Auto Parts Co., Waterbury, Conn., has been incorporated with authorized capital stock of \$10,000.

The American Brass Co., Waterbury, Conn., has secured a permit to build a one-story addition to its plant on Washington Street.

The Trimont Mfg. Co., Boston, Mass., is having plans drawn for an addition to its forge shop.

The Scovill Mfg. Co., Waterbury, Conn., has secured a permit for a small one-story addition to one of its buildings.

The J. Lipsitz Co., Inc., dealer in scrap iron, steel and metals, 289 Third Street, Chelsea, Mass., has purchased the machinery and equipment of the American Brewery, Roxbury, Mass. The plant contains three steam boilers, ice-plant, electric lighting plant, engines, copper kettles, belting, pulleys, shafting, etc.

## Philadelphia

PHILADELPHIA, Oct. 8.

The Midvale Steel & Ordnance Co., Philadelphia, has issued a list of 82 miscellaneous machine tools wanted for its howitzer plant now building at Nicetown. Some of these lists were sent out through error on the inquiry form of the Cambria Steel Co., but the purchasing department of the Midvale company advises that the entire list is for the Nicetown works.

The American International Shipbuilding Corporation, Philadelphia, has received quotations on about 40 tools. The Pusey & Jones Shipbuilding Co., Philadelphia, has also issued a small list and has already bought a few of the tools required.

It is reported that the Lanston Monotype Machine Co. and the S-S-E Co., both of Philadelphia, will make Colt's automatic pistols, but most of the buying of equipment will probably be done by the Ordnance Department, Washington.

The De Laval Steam Turbine Co., Trenton, N. J., is planning an addition for which new equipment will be required.

Nothing definite has been heard by the local machinery trade as to whether the Baldwin Locomotive Works will buy the list of equipment recently inquired for, but the belief is now quite general that the proposed Chicago plant will not be built. The Baldwin plant has received an additional contract for 500 locomotives, and it is also doing considerable work at Eddystone in the manufacture of trucks for long-range railroad guns.

Philadelphia machine-tool dealers are enjoying an exceptionally good business, a good deal of which is coming from various departments in Washington. The Navy Department last week placed an order for \$192,000 worth of boring and turning lathes for the new gun plant, known as Subhead No. 4, Washington Navy Yard. The Ordnance Department is buying heavily for plants which are engaged in the manufacture of gun-boring and turning lathes for the Neville Island gun plant and the gun-relining plant in France.

Frankford Arsenal, Philadelphia, has been granted an appropriation of \$1,000,000 for improvements. Much of this will be spent in construction and equipment of new departments for making cartridge cases. It is expected that \$500,000 will be spent for equipment.

The Abram Cox Stove Co., Philadelphia, is reported to have received a contract for semi-steel shells.

The War Department, Washington, has authorized additions to the plant of the Hero Mfg. Co., Gaul and Adams streets, Philadelphia, manufacturer of brass, bronze and aluminum products, to cost about \$150,000. The extensions will consist of three buildings, each about 200 ft. wide, the lengths to be decided; and a boiler plant, 30 x 30 ft.

Maris Brothers, Fifty-sixth Street and Gray's Avenue, Philadelphia, manufacturers of cranes, will build a one-story machine shop extension.

A one-story brick and concrete engine plant, 60 x 80 ft., will be erected by the Kent Mfg. Co., Clifton Heights, near Philadelphia, for factory operation.

Connery & Co., Second and Luzerne streets, Philadelphia, manufacturers of boilers, tanks, etc., have filed plans for a one-story shop, 75 x 180 ft., to cost \$10,000.

The William Cramp & Sons Ship & Engine Building Co., Beach and Ball streets, Philadelphia, is taking bids for an addition to its machine shop. It is also considering a two-story engine plant, 305 x 400 ft., at Bridge and Edmond streets, to cost \$100,000.

The American Insulation Co., Philadelphia, has purchased property adjoining its plant at Roberts and Stokley avenues, consisting of about 288 x 301 ft., for a reported consideration of \$22,000, as a site for extensions. A building permit has



been issued for a two-story and basement extension, 25 x 80 ft.

F. K. Pierson, Jr., 726 East Allegheny Avenue, Philadelphia, has filed plans for a one-story machine shop, 50 x 136 ft., at F and Atlantic streets, to cost \$6,000.

The Bureau of Yards and Docks, Navy Department, Washington, is having plans prepared for additions to the slips at the Government shipbuilding works at Philadelphia, to cost about \$100,000, including shop facilities, etc. Plans are also in progress for the erection of a new pattern shop at the League Island Navy Yard.

The Ordnance Department, Washington, has awarded a contract to Monaghan & Losse, Inc., 3016 Chestnut Street, Philadelphia, for the construction of a one-story tool-hardening shop at the Frankford Arsenal. The War Department has approved an appropriation of \$1,000,000 for the construction of additions to various buildings at the Arsenal to increase the capacity. A new local experimental shop to cost about \$275,000 will also be erected.

John J. Buckley, 2421 West Second Street, Chester, Pa., is taking bids for a one-story brick machine shop, 24 x 100 ft.

The Emergency Fleet Corporation, Philadelphia, has arranged for a fund of \$6,500,000 for the Philadelphia Electric Co. to provide for increased electric generating facilities. The plans of the company call for a total appropriation of \$14,500,000 for the completion of its new power plant at Beach and Palmer streets, and for an addition to its Chester plant, operated in the name of the Beacon Light Co., doubling the capacity of this station by the installation of a 60,000-kw. generator. Plans are now under way.

Following its recent purchase of about 15½ acres at Fox Street and Roberts Avenue, Philadelphia, as a site for a new plant for the manufacture of large caliber guns, the Government has taken title to a neighboring tract of land, consisting of about 1½ acres at Fox and Juniata streets, for a consideration of about \$15,000. It is understood that the entire tract will be used for the proposed gun works.

The Eastern Machinery & Equipment Co., Commercial Trust Building, Philadelphia, is taking bids for a one-story machine shop, 45 x 112 ft., at Camden, N. J.

The Concrete Steel Co., Camden, N. J., has awarded contract to the Lam Building Co., 1001 Wood Street, for a one-story extension, 20 x 32 ft., at Delaware and Pearl streets.

The New York Shipbuilding Co., Camden, N. J., is planning to lay the first keel at its new south yard plant, adjoining its present works, early in November. The plant is now more than one-half completed. The site covers about 60 acres, extending from the upper end of Gloucester City, at the mouth of Newton Creek along the waterfront. A group of 20 shops and other structures are now being constructed in the vicinity of the old Gloucester iron works, while another group of 10 buildings will be located on the east side of Broadway. Construction of two buildings of this latter group is now under way. The different buildings will include machine shop, boiler works, electric power plant, pipe shop, rigger shop, spar shop, engine house and storage buildings; two crane runways will be installed. Plans have just been filed for the plate and angle shop for the new plant extension, to consist of a main one-story building, 200 x 782 ft., located near the waterfront. Four other buildings in this group will average 100 x 500 ft. The plant will be provided with four wooden shipways with steel sheds. Permits have been issued for the construction of destroyer ways, 281 x 352 ft., as well as for a pump house, 30 x 95 ft. For yard service about 6 miles of railroad tracks and sidings have been installed. The entire plant is estimated to cost about \$8,000,000.

The Lebanon Steel Foundry Co., Lebanon, Pa., is having plans prepared for an addition.

The Lansdale Foundry Co., Lansdale, Pa., has broken ground for a one-story foundry, 50 x 120 ft., to cost \$20,000.

The Public Service Commission, Harrisburg, Pa., is arranging for the following stock and bond issues for different light and power companies in the state, to provide for proposed improvements and extensions in power plants and systems: Jefferson Electric Co., Scranton, \$50,000 in stock; Penn Central Light & Power Co., Altoona, \$125,000 in bonds; Penn Central Light & Transmission Co., Altoona, \$82,000; Kane Electric Light & Power Co., Kane, \$100,000, bonds, and \$254,712, stock; Penn Electric Service Co., Johnstown, \$500,000, bonds; Topton Electric Light & Power Co., Topton, \$50,000, bonds; Lycoming Edison Co., Williamsport, \$67,500, notes; Pennsylvania Water & Power Co., Holtwood, \$100,000, bonds; Citizens Light, Heat & Power Co., Johnstown, \$700,000, bonds; Penn Public Service Co., Philadelphia, \$139,000, bonds; Susquehanna Transmission Co., Holtwood, \$32,000, bonds; Philadelphia Suburban Gas & Electric Co., Philadelphia, \$27,000, bonds; Duquesne Light Co., Pittsburgh, \$15,000,000 in bonds, and \$10,000,000 in notes;

Williamsburg Electric Co., Huntingdon, \$30,000, bonds; Lehigh Valley Transit Co., Allentown, \$185,000, bonds, and the Boyertown Electric Co., Boyertown, \$20,000 in bonds.

The Carpenter Steel Co., Reading, Pa., is building a two-story addition, 20 x 60 ft., at River Road and Exeter Street, to be known as Building No. 40, to cost \$40,000. A one-story steel chipping shed, 40 x 100 ft., is also being built.

The Erie Railroad Co., 50 Church Street, New York, will build a one-story engine house and shop buildings at Brickerville, Pa., to cost \$25,000.

The Vulcan Iron Works, Main Street, Wilkes-Barre, Pa., is having plans prepared for a one-story power plant.

The Cumberland Valley Railroad Co., Chambersburg, Pa., is having plans prepared for an engine house to cost \$30,000. Crosby Tappen is engineer.

## Baltimore

BALTIMORE, Oct. 7.

The Whitney W. Jones Machine Co., Industrial Building, Preston Street and Brentwood Avenue, Baltimore, has been incorporated with \$5,000 capital stock to manufacture engineers', steam, electrical, machinists', pier, bridge, mine, mill and railroad supplies and equipment, etc. The incorporators are Whitney W., Julia M. and Howard E. Jones.

The Poole Engineering & Machine Co., Woodberry, Md., will build a one-story forge shop, 30 x 104 ft., at Railroad and Woodberry avenues, to cost \$5,000. The contract has been awarded to Hicks, Tase & Norris.

The Modern Way Co., 16 East Lexington Street, Baltimore, has been incorporated with \$10,000 capital stock to manufacture heating plants, apparatus, etc. The incorporators are Claude Hughes, Hyman Amernick and R. Legare Webb.

The Western Maryland Railway Co., Baltimore, will build additions to its Hagerstown shops.

The War Department, Washington, has approved appropriations as follows: Additions to the Rock Island Arsenal, Rock Island, Ill., to cost \$833,500; construction of a phosphorus plant at Fairmont, W. Va., to cost \$500,000. The American Phosphorus Co., Philadelphia, Pa., will build and operate the works. Construction of a tetryl plant at Senter, Mich., to consist of main plant, magazines, power house, boiler plant and other structures, including tramways, to cost \$250,000.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids for a naval torpedo assembly plant to be erected at Alexandria, Va., at a cost of \$950,000. It will include a main building, reinforced concrete, four stories, 123 x 300 ft., and a two-story structure, 114 x 245 ft.

Fire, Sept. 24, destroyed the vulcanized fiber plant of Marshall & Mitchell, Wooddale, Del., with loss reported at \$40,000. It is said that the mill will be rebuilt.

The E. I. duPont de Nemours Co., Wilmington, Del., has awarded contract to the Realty Construction Co., Eleventh Street, for the erection of a two-story and basement addition to its experimental plant, 44 x 50 ft., to cost with equipment \$25,000.

The Eagle By-Products Co., Charleston, W. Va., has secured permission from the Capital Issues Committee to issue securities for \$150,000 to provide for additions to its by-product coal plant to increase present capacity. It is proposed to develop the works to a maximum output of over 1500 tons daily.

The Bureau of Yards and Docks, Navy Department, Washington, is planning the construction of a galvanizing plant at Norfolk, Va., to cost \$100,000. The department has also had plans prepared for a new electric distributing system at Hampton Roads, Va., to cost \$50,000.

The Sutherland Coal Co., Clintwood, Va., recently incorporated with a capital of \$50,000, is arranging for the purchase of equipment for the operation of coal properties at Splash Dam, Va. It will inaugurate operations on a tract of about 50 acres, and plans an aggregate output of 50 tons daily. E. H. Sutherland is president.

The Reynolds Corporation, Louisville, Ky., has leased property at Bristol, Va., for a powder container manufacturing plant for the Government. The initial works will give employment to about 400.

The American Cellulose & Chemical Co., 613 Fifth Avenue, New York, has awarded a contract to the George A. Fuller Co., Munsey Building, Washington, for the construction of a plant at Cumberland, Md., to cost \$5,000,000. The plant will be used for Government work.

The National Pipe & Foundry Co., Gadsden, Ala., is arranging for the rebuilding of its plant, including machine shop, steam-fitting shop and other buildings, recently destroyed by fire with a loss of about \$100,000.

The Atlantic Refining Co., Philadelphia, Pa., has acquired about 500 acres at Brunswick, Ga., for a refining plant. It is said that the new works will have a capacity of about 2000 bbl. of refined oil daily, and will cost over \$1,000,000.

The National Steel Products Co., Bessemer, Ala., is planning to issue securities for \$66,000 for proposed extensions.

The Maryland Glass Co., Law Building, Cumberland, Md., has been incorporated with \$95,000 capital stock to manufacture blown glass articles. The incorporators are George Louis Eppler, John P. Schellhaus, Henry G. Glick and others.

The Guyan Machine Shops, Logan, W. Va., is seeking prices on low-voltage generators, power hammers, angle irons, cold rolled shafting, brass rods and strips, pulleys, hangers, boxings, pumps, steel plates, pipe, ventilating fans, bolt headers, bolt threading machines, shapers, twist drills, flat drills and magnet wire.

The J. G. Tilley Co., Bristol, Va., wants prices on locomotive cranes.

## Chicago

CHICAGO, Oct. 7.

Inquiries are appearing at a rate that makes up a very respectable total, despite the fact that individually the majority is small. With some tools, the makers of which have their order books pretty well cleaned up, deliveries are now being made on B-4 priority orders to replenish dealers' stocks. Where they are still behind on orders the builders cannot make such deliveries and special priorities or those rating higher than B-4 are effective. Most milling-machine manufacturers have sufficient orders to keep them busy for some months to come, one maker being unable to promise delivery this year.

Several tools which it was confidently expected would be shown at the machinery exhibit in connection with the convention of the American Foundrymen's Association at Milwaukee this week never got started for the convention city. They were ordered long ago for exhibition purposes, but urgent priority orders caused their shipment direct to service.

Several large contracts for rifle grenades have been placed in this territory. The International Harvester Co. will make 5,000,000 hand and rifle grenades and also has a contract for 750,000 6-in. shells. The Briggs & Stratton Co., Cutler-Hammer Mfg. Co., Evinrude Motor Co., Milwaukee, and the Stewart-Warner Speedometer Co., Chicago, have also received contracts for rifle grenades. The total output of the four latter plants will be about 140,000 grenades per day. The A. O. Smith Corporation, Milwaukee, has received a contract for aerial bombs.

The Edwards Valve & Mfg. Co., East Chicago, Ind., has a new contract for 3-in. shells, but is well equipped. The Crane Co., Chicago, has a new contract for trench mortars. Fairbanks, Morse & Co., Chicago, has received a contract for 35,000 10-ton tractor trailers.

The Allis-Chalmers Co., West Allis, Wis., which for some time has been manufacturing 75-mm. shells, is figuring on a contract for 6-in. shells which probably will bring the company into the market for machine tools.

The Rock Island Arsenal, recently mentioned as a buyer, is understood to have three lists compiled, against some of which purchasing is held up pending appropriations. One list comprises about \$200,000 worth of tools.

Contracts have been let for the construction of a one-story extension, 81 x 86 ft., to the plant of the United States Ball Bearing Mfg. Co., 4535 Palmer Street, Chicago, to cost \$15,000.

Samuel Olson & Co., engineers, 2418 Bloomingdale Road, Chicago, will add a one-story extension, 50 x 126 ft., to their factory at a cost of about \$12,000.

The Gardiner Metal Co., 1364 West Lake Street, Chicago, has awarded contracts for a one and two-story factory to cost \$15,000. Work has begun.

The Federal Furnace Co., East 108th Street and the Calumet River, has obtained a permit for the erection of a one-story machine shop, 53 x 59 ft., and 37 ft. high, to cost \$20,000. Federal permission has been given for the building.

An order for 150 motor trucks from an Atlanta, Ga., sales firm has been placed with the Gary Motor Truck Co., Gary, Ind. The company is enlarging its plant with a view of tripling its production.

The Manufacturers Equipment Co., 200 North Jefferson Street, Chicago, has completed foundation work for a one-story machine shop addition, 50 x 80 ft., on South Waller Avenue.

The Mueller Metal Co., Decatur, Ill., has broken ground for a one-story addition, 200 x 300 ft.

The Whiting Foundry Equipment Co., Harvey, Ill., has commenced the erection of a one-story addition, 140 x 150 ft., to cost \$33,000. J. H. Whiting is president.

The American Wagon Co., Dixon, Ill., will build a two-story addition, 80 x 90 ft., to its plant on Lincoln Avenue to cost about \$10,000.

The North-Western Stamping Co., Inc., Burlington, Iowa, has completed its new factory, 100 x 180 ft. The company makes a specialty of dies and sheet metal stamping, and has just completed two orders for the Navy Department.

## Milwaukee

MILWAUKEE, Oct. 7.

The machine-tool trade continues active, and a large volume of single tool and small-lot requirements are being received from the Central and Eastern states. Milling machines the past week have been active, and gas engine manufacturers are furnishing a large amount of orders in small lots. A considerable amount of local business is still being developed.

Foundries and machine shops in Milwaukee and the immediate vicinity anticipate one of the most active weeks in their history, due to the international metals congress beginning here today.

Crane manufacturers still are obliged to strain every resource to fill a huge volume of business.

The acute shortage of skilled labor continues a dominating factor, but good progress is being made under Government supervision and control.

The Gas Tank Recharging Co., Milwaukee, has increased its capital stock from \$250,000 to \$1,000,000, to finance the construction of a new calcium carbide manufacturing plant which is being established at Keokuk, Iowa. A shop for the manufacture of steel drums and other shipping containers is being erected which will be equipped with bending, punching, welding and cutting tools and other machinery.

The Hausmann Motor Cycle Co., Milwaukee, has been incorporated with a capital stock of \$600,000 to manufacture motor vehicles. Details have not been completed. The incorporators are H. J. Hausmann, M. Jovanovich and Julius H. Zahn, 519 Caswell Block, Milwaukee.

The Chain Belt Co., Milwaukee, which is enlarging its malleable iron foundry at Thirty-ninth Avenue and Orchard Street, will also erect a one-story chain assembling shop, 100 x 300 ft., of reinforced concrete, steel and brick. The additional facilities are made necessary by large Government contracts. Donald Fraser is vice-president and works manager.

James Aylward & Sons Co., Neenah, Wis., has awarded a contract to the C. R. Meyer Construction Co., Oshkosh, Wis., for the erection of a one-story gray-iron foundry addition, costing about \$20,000. The architects are Auler & Jensen, Oshkosh.

The Oshkosh Mfg. Co., 412 South Main Street, Oshkosh, Wis., manufacturer of tools and other mechanical appliances, will build a two-story machine shop addition, 40 x 100 ft., and has awarded the general contract to the Fluor Brothers Co. A large part of the equipment has been contracted for. Elmer Leach is president.

The Dings Magnetic Separator Co., 671 Smith Street, Milwaukee, has broken ground for a one-story shop addition, 30 x 75 ft., of reinforced concrete and brick, costing about \$10,000 with equipment.

The E. C. Tecktonius Mfg. Co., Racine, Wis., has acquired property adjacent to its hardware specialty manufacturing plant at Thirteenth and Racine streets for extensions. A new office building will be erected at once. Fred A. Tecktonius is secretary.

The Andis Tool Co., Racine, Wis., has been organized by Matthew Andis, John Oster, Frank Bichahm and Henry E. Meltzer to manufacture machinery, tools, dies, etc. The capital stock is \$15,000.

The Pressed Steel Tank Co., Milwaukee, is erecting another shop addition, 80 x 175 ft., at Greenfield and Fifty-seventh avenues, West Allis. The plant has been more than doubled in size and capacity the past year. R. H. Hackney is president and general manager.

The United States Gear Shift Co., Eau Claire, Wis., is installing machine tools and other equipment in its new manufacturing plant. The building is four stories, 80 x 80 ft., and will be equipped to manufacture complete hydraulic gear-shifting devices for motor vehicles. For the present, however, nearly the entire capacity will be devoted to Government contracts for small parts for gun mounts. C. A. Olson, associated with the production division, Emergency Fleet Corporation, is works manager.

The Manitowoc Shipbuilding Co., Manitowoc, Wis., which recently acquired 750 ft. of additional frontage adjacent to its yards, will use the site for a new fabricating building, 40 x 200 ft., two stories, of brick and steel, and a paint shop, 40 x 60 ft., one story. L. E. Geer is general manager.

Albert E. Briggs, Rhinelander, Wis., has established a small machine shop on North Brown Street, and will specialize in light machine, automobile and motorcycle repairs.

The Sieverkropp Engine Co., Racine, Wis., manufacturer of marine and other gas engines, is constructing a 24-cylinder, two-cycle, rotary gas engine, designed for aviation purposes and expected to develop 500 hp. at 1400 r.p.m. The work is being done in behalf of the Government, and is based on a new design of motor evolved by Henry Sieverkropp, president and chief engineer of the company.

The Electropure Dairy Co., Burlington, Wis., will invest \$35,000 in the construction and equipment of an electrically-operated milk condensing plant in Union Grove, Racine County.

## Detroit

DETROIT, Oct. 7.

The demand for machine tools is confined almost entirely to munition makers with priorities. Building construction, except for plants on war work, has ceased.

It is estimated that war contracts in Detroit have passed the \$1,000,000,000 mark, while plants through the State are engaged in Government work aggregating another billion. One local company has contracts for more than \$200,000,000, another for \$134,000,000, while two shipbuilding concerns have a combined total larger than either of these.

Production of Liberty airplane motors has increased rapidly. On Sept. 30 the Ford Motor Co. completed 120 engines in one day. The Lincoln Motor Co., Detroit, has exceeded its monthly estimates, while the Fisher Body Corporation is making complete planes at the rate of 30 or 40 per day.

The Ford Motor Co., Detroit, has received a Government contract for searchlight carriages and will shortly buy the tools for this work. It is reported that the Ford interests may not go ahead with the proposed tractor plant at Hamilton, Ohio, but may build a tractor plant on Green Island, near Albany, N. Y., subject to Government approval. The Olds Motor Works, Lansing, Mich., may not buy the list of tools for which inquiries were recently made, but will use its present equipment for making parts of Liberty airplane motors on a sub-contract from the Buick Motor Co., Flint, Mich. The Federal Motor Truck Co., Detroit, will hereafter build its own parts and will buy equipment for this work.

Among Michigan concerns awarded Government orders are the following: Lufkin Rule Co., Saginaw, metallic tapes; Industrial Works, Bay City, spares for locomotive cranes; E. D. Edwards & Co., Detroit, steel blocks; Field Mfg. Co., Owosso, crating machine shop truck bodies; Imperial Shipbuilding Co., Detroit, coal barges; American Electrical Heater Co., Detroit, air heaters; Detroit Lubricating Co., Detroit, mechanical oilers; Togan Stiles Co., Grand Rapids, portable buildings; Grand Rapids Refrigerating Co., Grand Rapids, refrigerators; American Carbonic Machine Co., Grand Rapids, refrigerating equipment; Keeler Brass Co., Grand Rapids, belt fasteners; Anderson Forge & Machinery Co., Detroit, plug forgings; Kalamazoo Railway Supply Co., Kalamazoo, tractor and trailer couplers; Cadillac Motor Car Co., Detroit, unit tractor power plant; Hutchins Car Roofing Co., Detroit, tool fastenings; Commerce Motor Car Co., Detroit, tire pumps; Lansing Co., Lansing, dock trucks.

The Central Forge Co., Detroit, will erect three one-story factory buildings, 96 x 192 ft., 60 x 301 ft. and 63 x 301 ft., respectively, on Euclid Avenue, East, at an expenditure of \$500,000.

The Spencer-Smith Machine Co., Howell, Mich., which is working on aircraft pistons for Liberty, Curtiss and Hispano-Suiza motors, has arranged for extensions which will practically double the size of the plant. The additions will be L-shaped and provide a total of 13,600 sq. ft. of floor space.

The Langell Shipbuilding Corporation, St. Clair, Mich., builder of tugs and barges and capitalized at \$50,000, has elected the following officers: President, Gus Hill, Port Huron; vice-president, Daniel E. Lynn, Port Huron; secretary, Alexander Langell, Cleveland; manager and treasurer, Walter Langell, St. Clair. The officers, with George F. Lynn, Cleveland, form the board of directors.

The Detroit Copper & Brass Rolling Mills, Clark Avenue, Detroit, is having plans prepared for an addition to its plant to cost about \$350,000.

The Richard Brothers Die Works, 264 Trombley Avenue, Detroit, has awarded a contract to A. R. Yops & Co., Kresge Building, for a one-story plant, 40 x 100 ft., on Milwaukee Avenue, for the manufacture of machine parts.

A one-story boiler plant, 65 x 100 ft., will be erected by the Anderson Forge & Machine Co., Detroit, on East Jefferson Street.

The Charles Bohn Foundry Co., Hart Avenue, Detroit, has had plans prepared for a one-story addition, 40 x 120 ft., at Chene and Finley avenues.

## Cleveland

CLEVELAND, Oct. 7.

The local machinery market was very active the past week. The Willys-Overland Co., which came out with a large list the previous week, placed orders estimated at between \$300,000 and \$400,000 for lathes, grinding machines, hand milling machines, special deep hole sensitive drilling machines and other equipment for work on 8 and 12-cylinder Liberty motors. The business was divided between Cleveland and Toledo dealers and the machinery will go to its plants at Toledo and Elyria. The American Shipbuilding Co. has prepared another large list of requirements, but it has been held up temporarily. A local manufacturer took an order for 31 screw machines for shipment to England and a new inquiry came out from the American Multigraph Co., Cleveland, for 25 screw machines. Business the past week was largely in small lots, which was well distributed among plants engaged on munitions, truck and airplane work. The Matthews Engineering Co., Sandusky, placed an order for about 25 machines for making auxiliary lighting plants. The Swinehart Tire & Rubber Co., Akron, is inquiring for a 24-in. shaper and the Ohio Collieries Co., Toledo, for a 36-in. lathe.

Stove manufacturers in Cleveland and other parts of northern Ohio are rapidly turning their plants over to Government work now that restrictions prevent them from continuing operation except to a limited extent on their regular products. The Best Foundry Co., Bedford, which operates a foundry as a part of the American Stove Co., has taken an order for 150,000 6-in trench mortar shells, of gray iron, which will be machined and finished in the foundry. This order will necessitate the purchase of some machinery equipment. Other Ohio stove plants have considerable Government business, and are engaged in the manufacture of large field ovens and rolling kitchens.

The Government is placing orders for 40,000 tractors of the Miller four-wheel drive type for hauling artillery. A contract for the axles has been placed with the Timken-Detroit Axle Co. It is understood that an order for building 10,000 tractors, with the exception of the axles, has been placed with the Packard Motor Car Co., Detroit.

The Chandler Motor Car Co. has delivered to the Government 100 caterpillar tractors of 10 tons' capacity for hauling artillery and is understood to have reached quantity production. It is expected that 1000 of the Government order for 3000 will be delivered by Jan. 1.

The Cleveland Galvanizing Works Co., Cleveland, has changed its name to the Chain Products Co. Its principal activities for some time have been the manufacture of weldless chain and the new name was adopted as being more appropriate. The company will continue to operate its custom galvanizing department in addition to the manufacture of chain. The officers are F. G. Hodell, president and treasurer; R. H. Hodell, vice-president, and William F. Schneider, secretary.

The Rawson Safety Guard Co., Cleveland, has been organized to manufacture guards for machinery, pulleys, windows and shop partitions and has established a plant at 6109 Franklin Avenue, N. W. Expanded metal will be used. J. F. Leonard is president and C. M. Eberling vice-president and general manager.

The Brown Hoisting Machinery Co., Cleveland, will erect a two-story factory, 120 x 140 ft. Plans are being prepared by Ernest McGeorge, engineer, 1900 Euclid Avenue, Cleveland.

The Buckeye Brass & Mfg. Co., Cleveland, maker of brass specialties, has moved its plant from Columbus Road to the building at East Sixty-fifth Street and Hawthorne Avenue, formerly occupied by the Cleveland Pneumatic Tool Co.

The Simmons Mfg. Co., Cleveland, has purchased a one-story factory at East Thirty-fifth Street and Perkins Avenue, which it will use for the manufacture of repair parts for light trucks and passenger automobiles. The Simmons Co. has outgrown its present quarters at 2337 East Fourth Street.

The Steel Products Co., Cleveland, will build a one-story machine shop addition, 89 x 120 ft.

The Nickel Plate Railroad, through its purchasing department in Cleveland, has an inquiry out for an 18-in. tool room lathe and a 3-head bolt cutter.

The Willys-Overland Co., Toledo, has taken a large contract for the manufacture of chassis and parts for whippet



tanks for the British Government. The company is largely engaged in making airplane motors, gun carriages and machining shells, and it is expected that the plant will be entirely on a war basis by the end of the year.

## Cincinnati

CINCINNATI, Oct. 7.

The Procurement Division, Ordnance Department, is understood to be gathering information from lathe makers looking toward the placing of orders for approximately 4000 20 and 24-in. lathes. Within the past few days a local machine tool builder accepted an order for 100 36-in. lathes, and it is understood that the Ordnance Department will place more orders for this size within a short time.

Building operations for September showed a decided falling off over the record of previous years. The total permits issued show an estimated amount for improvements of only \$212,080, against \$798,890 for the same month in 1917. It is impossible to obtain permits for extensions unless plants are engaged strictly in essential work. Much complaint is made regarding deliveries of building materials, and several firms will not be able to occupy new plants as soon as was contemplated. The labor situation is also holding up construction, and common labor is more scarce than ever.

The Cincinnati Auto Specialty Mfg. Co., Cincinnati, now engaged in essential work, will remove its plant from its present location on Elm Street to 312 Main Street, which will enable it to double its capacity.

The Cincinnati Bickford Tool Co. is occupying its addition to its main building in Oakley suburb.

The A. V. Carroll Machine Tool Co., Cincinnati, expects to have its new plant in Hyde Park in full operation before Dec. 1.

Work on the new plant of the Central Frog & Switch Co., Cincinnati, is almost completed, and equipment is being installed in a part of the building.

The Carroll & Jamieson Machine Tool Co., Batavia, Ohio, lathe maker, is building an addition that will enable it to greatly increase the present capacity.

The Mosler Safe Co., Hamilton, Ohio, is installing equipment in its addition, to be used for making gun carriages.

It is reported that the Hooven, Owens & Rentschler Co., Hamilton, Ohio, has tentative plans for an addition to its plant. The company has a large contract for marine engines.

The Dayton Pneumatic Tool Co., Dayton, Ohio, is building an addition to its plant on Hartford Street, estimated to cost \$35,000, which will enable it to greatly increase its output of pneumatic hammers for which it has a large Government order.

The Dayton Electrical Mfg. Co., Dayton, is adding equipment to its plant on Fourth Street.

Work is progressing rapidly on the new plant of the Advance Foundry Co., Dayton, which is expected to be in operation by Jan. 1.

## The Central South

LOUISVILLE, Oct. 7.

The Standard Sanitary Mfg. Co., Pittsburgh and Louisville, has received a Government contract to finish shells from rough castings in the Louisville Ahrens & Ott plant. It is understood that the order is for finishing 1,000,000 155-mm. shells, and a large quantity of machinery will be required for handling this work. None of the shells will be loaded in Louisville.

The shell department at the munition works of the Columbian Iron Works, Chattanooga, Tenn., was destroyed by fire Sept. 30, with a loss estimated at about \$75,000. It is understood that the structures will be rebuilt immediately.

Davis Brown of the Bizz Engineering Co., Louisville, reports that work on the new plant to manufacture conveying equipment and pumps is being held up on account of slow deliveries and inability to obtain labor. It will be some weeks before the plant is ready for operation.

The Triangle Lumber Co., Memphis, Tenn., has obtained 3500 acres of timber land and will erect sawmill at Midnight, Miss.

Lathes and other machinery are required by the Dominion Lumber & Handle Co., Bristol, Tenn., which was recently incorporated with a capital of \$50,000 by J. F. McCrarry and others.

The University Utilities Co., Sewanee, Tenn., Charles M. Best, manager, is asking prices on ditching machinery.

The power house of the Mobile Electric Co., Mobile, Ala., was recently destroyed, including a 4000-hp. turbine.

An 8 x 48-in. automatic gear cutting machine is wanted by the Stewart-Hilty Machine Co., Birmingham, Ala.

P. M. Adler, manager of the Steele & Adler Coal Co., Girdler, Ky., wants prices on an air compressor, small dinky locomotive and punching machine for cutting coal.

The Gordon-Miller Coal & Coke Co., Louisville, is contemplating the construction of a power plant and the installation of electrically driven machinery at its mine in eastern Kentucky.

The J. G. Tilley Co., Bristol, Tenn., is asking for quotations on a 42-in. gage saddle tank locomotive, 16 to 20 tons. It is also in the market for locomotive cranes.

The Shannon Motor Co., Harlan, Ky., has increased its capital from \$3,000 to \$21,000, and has plans for a new building and shop.

The I. M. Darbell Sons Co., Memphis, Tenn., will rebuild its burned band mill at a cost of \$25,000.

## Indianapolis

INDIANAPOLIS, Oct. 7.

The Highway Iron Products Co., Ligonier, Ind., has increased its capital stock to \$50,000.

The Lincoln Way Brass Foundry Co., South Bend, Ind., has been incorporated with \$18,000 capital stock to manufacture iron products. The directors are Sherman P. Stults, Charles Heckathorn and Henry Johnson.

The Indiana Iceless Cooler Co., Indianapolis, has been incorporated with \$75,000 capital stock to manufacture refrigerators. The directors are Frank H. Shanahan, John W. Losh and Edward H. Mitler.

The Terre Haute Handle Co., Terre Haute, Ind., has received a Government contract for pick mattock handles; the Kokomo Steel & Wire Co., Kokomo, Ind., for shell steel forging bars, and E. C. Atkins & Co., Indianapolis, for hack saw blades.

## St. Louis

ST. LOUIS, Oct. 7.

The Dielectric Mfg. Co., 224 South Vandeventer Avenue, St. Louis, is in the market for electric motors and rubber compounding machinery. J. J. Kessler is president.

Work has been started on the second shell making plant for the Laclede Gas Light Co., St. Louis. The building contract, amounting to \$500,000, has been let to the Fruin Colton Contracting Co., St. Louis. J. A. V. Scheckenbach, American Car & Foundry Co., Detroit, Mich., is supervising engineer for the building work and equipment and is in charge of the purchasing of machinery.

The Christopher & Simpson Iron Works Co., Ninth Street and Park Avenue, St. Louis, has acquired 36 acres at the northwest corner of Big Bend Road and Missouri Pacific Railroad in St. Louis County with a view of erecting a structural iron plant. W. S. Simpson is president.

The John Ramming Machinery Co., 300 South Main Street, St. Louis, will build a three-story addition, 45 x 100 ft., and will be in the market for machinery.

The Independent Packing Co., Tulsa, Okla., will rebuild its burned plant, requiring about \$50,000 worth of machinery.

Edward Hearn, Sparkman, Ark., will re-equip the electric light and power plant recently destroyed by fire.

The Prairie Pipe Line Co., Wann, Okla., will extend its line to the Forrman field and will install oil pumping equipment.

The Farmers Monette Gin & Mill Co., Monette, Ark., is in the market for about \$8,000 worth of cotton compress equipment.

The Arkansas Short Leaf Lumber Co., Little Rock, Ark., has increased its capital by \$400,000 to enlarge its capacity.

The American Butter Co., Kansas City, Mo., will install a 25-ton ice machine, 60 hp. boiler, motors, etc. J. S. Carpenter, 540 Walnut Street, is president.

W. K. Henderson, Shreveport, La., will install electrical and mechanical equipment for the repair of generators, magnetos and other appliances.

Gerber, Okla., Black & Veatch, Kansas City, Mo., engineers, is in the market for \$25,000 worth of waterworks equipment.

The Big Bend Cooperage Co., Greenwood, Miss., will rebuild its burned plant. About \$60,000 worth of machinery is required.

The Mississippi River Commission, Custom House, Memphis, Tenn., is in the market for boilers, turbines, pump set,

feed water heater and electric light plant for a hydraulic grader.

The Washington University, St. Louis, will equip a machine shop, 32 x 220 ft. A traveling crane, benches and motors will be needed. Dean Langsdorf should be addressed.

The St. Louis Frog & Switch Co., Wellston, Mo., has let the contract for an addition, 55 x 100 ft., to its forge shop on St. Charles Rock Road to the Fruin Colnon Construction Co., Laclede Building, St. Louis, amounting to about \$10,000.

The Monarch Metal Weather Strip Co., St. Louis, has increased its capital stock from \$100,000 to \$130,000 with the view of extending its business.

H. Bollwerk & Brothers, St. Louis, have been incorporated with \$18,000 to manufacture automobiles. The incorporators are Henry, Joseph, H. B. and K. A. Bollwerk.

The Key Boiler Equipment Co., St. Louis, has increased its capital stock from \$30,000 to \$120,000.

## Texas

AUSTIN, Oct. 5.

The Texas Crate & Basket Co., San Antonio, has been incorporated with a capital stock of \$36,000, and will construct a plant. Joe Flory is a stockholder.

It is announced that the Government will lay a 10 or 12-in. pipe line from the Petrolia natural gas field to Fort Worth, a distance of 95 miles.

The board of directors of Irrigation District No. 2, Harlingen, will purchase pumps, engines and other equipment to increase the capacity of the pumping plant to supply water for 40,000 acres.

The Farmers Gin Co., Blum, will build a cotton gin to cost \$10,000.

## California

SAN FRANCISCO, Oct. 1.

The demand for machine tools continues brisk, especially from the shipyards. Federal authorities have been speeding up the work and many subcontracts have been given to the smaller shops, which are constantly increasing their equipment. The main trouble, however, is to get enough men to run the machines.

The Hanlon Shipbuilding Co., Oakland, has completed its new machine shop and is installing machinery.

The Southern Pacific Co., San Francisco, is said to be preparing to erect a steel foundry addition to its shops at Sacramento.

The American Can Co. will begin work Nov. 1 on an addition to its plant at Honolulu to cost approximately \$300,000, and which will enlarge its output from about 80,000,000 to 125,000,000 cans annually. The machinery is said to have been ordered.

The Salt Lake Railroad, Pacific Electric Building, Los Angeles, has had plans prepared for the construction of a new tank car repair shop, 200 x 220 ft., to cost about \$150,000. The engineering department is in charge of the work.

The R. J. Chandler Shipbuilding Co., Wilmington, Los Angeles, operating a plant on Mormon Island, has filed plans for the construction of a two-story addition, 44 x 72 ft.

The Atlas Brass Foundry, Los Angeles, has been incorporated with a capital of \$10,000 to manufacture castings, etc. M. M. Anderson, Charles W. Lyon and Frederick W. Heyser, Los Angeles, are the incorporators.

The Los Angeles Shipbuilding & Drydock Co., San Pedro, Los Angeles, has filed plans for the construction of a one-story addition, 50 x 165 ft., to be used as a welding and erecting shop.

An electric pumping plant will be installed by the City Council, Newport, Cal., in connection with its proposed new sewerage system to cost about \$172,370.

A one-story, reinforced-concrete boiler plant, 60 x 70 ft., will be erected by the Union Oil Co., Union Oil Building, Los Angeles, at its works at Wilmington.

The Meyer Gessner Co., 2610 South Main Street, Los Angeles, has been organized to manufacture metal products. Max Meyer, 4044 Moneta Avenue, heads the company.

The San Diego & Arizona Railroad, San Diego, Cal., has completed plans for the construction of new locomotive and car repair shops in the vicinity of Sixteenth Street and Newton Avenue. A new engine house will also be erected.

Conveying, handling machinery and other equipment will be installed by the Globe Grain & Milling Co., Vernon, Cal., in the additions to be constructed at its cotton seed oil works, Santa Fe Avenue and Fifty-first Street.

The Los Angeles Graphite Corporation, Los Angeles, has

been incorporated with a capital of \$100,000 to manufacture graphite products. H. Fred Scott, South Pasadena; M. H. Levy, Glendale; and Arthur J. Bruce, Los Angeles, are the incorporators.

The Los Angeles Wire & Iron Works, 129 East Seventh Street, Los Angeles, has been organized to manufacture iron and metal specialties. Andrew Biescar heads the company.

The Pike Automobile & Trailer Works, Los Angeles, has been organized to operate a repair and part manufacturing plant at 317 Central Avenue. Joseph L. Pike, 225 West Forty-seventh Place, heads the company.

The Knight Co., Sutter Creek, Cal., operating a foundry for the manufacture of mining machinery, has acquired the plant and planing mill of D. V. Ramazzotti, in the vicinity of its works.

The Board of Education, Los Angeles, is having plans prepared for the construction of two one and two-story shop buildings, 40 x 80 ft., for industrial work at the Jefferson and Lincoln high schools.

## The Pacific Northwest

SEATTLE, Oct. 1.

The labor situation shows no improvement, particularly in shipyards. There is little doubt that women will be employed in increasing numbers, and one of the big shipyards is making arrangements for special housing facilities in the belief that many women will be brought from outside towns to relieve the situation.

It is authoritatively stated that large orders for machinery and equipment for trade vessels will shortly be forthcoming from Russia.

The Seattle Machine Works, Seattle, will erect a blacksmith and boiler shop, 41 x 60 ft., to cost about \$10,000, exclusive of equipment.

The Victoria Machinery Depot, Victoria, B. C., has been awarded a contract for two 8100-ton steel vessels and has been advised that it will receive sufficient orders to keep it in operation for three years.

The General Machinery Co., Spokane, contemplates an investment of \$50,000 in enlargement and equipment of its plant at Riverside Avenue and Freya Street.

The Aurora Foundry, Seattle, recently destroyed by fire, will be rebuilt at once. The new structure will be one-story, 70 x 120 ft., and will contain electric furnaces and a large traveling crane.

The Stearns Lumber & Shingle Co., Stearnsville, Wash., was completely destroyed by fire, with a loss of \$75,000. The lumber mill had a capacity of 30,000 ft. and the shingle mill, 250,000 ft.

The Skinner & Eddy Shipbuilding Corporation, Seattle, will construct a heavy-timbered, corrugated iron carpenter shop, 100 x 420 ft. to cost \$50,000.

The Portland Cement Pipe & Tile Co., and the Concrete Pipe Works, with plants in Vancouver, Tacoma and Walla Walla, Wash., have combined their interests under the name of the Concrete Pipe Co., with offices in Portland. The Portland and Vancouver plants will be enlarged to increase the output.

The Hendry Foundry Co., Vancouver, B. C., will construct a new foundry, 60 x 80 ft., adjoining its present plant, at a cost of \$6,000.

The Tudhope Electric Metals Co., Vancouver, B. C., will build a new foundry 50 x 100 ft.

The Oregon Boiler Works, Seattle, plans the immediate erection of a frame boiler shop, 54 x 80 ft., at 3493 Klackit Avenue, to cost \$6,000, exclusive of equipment.

The J. F. Duthie Shipbuilding Co., Seattle, is adding two new plate shops each 300 ft. long to its plant. A number of other improvements are under way.

The Morrison Mill Co., Anacortes, Wash., plans improvements to its plant and the installation of new machinery, representing an expenditure of \$75,000.

The Stillwater Lumber Co., Centralia, Wash., whose plant was recently destroyed by fire with a loss of \$125,000, will construct a new plant, of smaller capacity, to turn out large timbers exclusively.

## Canada

TORONTO, Oct. 6.

The Brantford Computing Scale Co., Ltd., Brantford, Ont., has been incorporated with a capital stock of \$500,000 by Archibald L. McPherson, Edward Cutmore, Dufferin T. Williamson and others to manufacture scales, slicers, hardware and other articles.

The Dominion Windshield Cleaner Corporation, Ltd., Hamilton, Ont., has been incorporated with a capital stock of

\$50,000 by George A. Hancock, Percy W. Springer, Stanley H. Slater and others to manufacture automobiles, accessories, windshields, etc.

The Ascot Tile & Brick Co., Ltd., Ascot Corner, Que., has been incorporated with a capital stock of \$75,000 by Edouard L. Darche, Ascot Corner; George A. Darche, Sherbrooke, Que., and others to manufacture brick, tile, etc.

The Dryden Pulp & Paper Co., Ltd., Dryden, Ont., has been incorporated with a capital stock of \$1,000,000 by Daniel W. Lang, care the Union Trust Co.; Hugh S. Honsberger, William C. W. Simons and others, all of Toronto, to manufacture pulp, paper, etc.

The Jackson Signal Co., Ltd., Guelph, Ont., has been incorporated with a capital stock of \$40,000 by George B. Jackson. Walter E. Buckingham, Archibald Holm and others to manufacture railroad signal devices and torpedoes, fuses, etc.

The Universal Cartridge Co., Ltd., Toronto, has been incorporated with a capital stock of \$2,000,000 by James Ross, Toronto; James B. Tudhope, William H. Tudhope and others of Orillia, Ont., to manufacture cartridges and other munitions.

The Hercules Rubber Co., Brampton, Ont., is in the market for two 100 hp. boilers to test 100 lb., and one 200-hp. engine, Corliss preferred.

The plant of the Canadian Wood Products, Ltd., 1000 Gerrard Street East, Toronto, was damaged by fire Sept. 28, with a loss of \$65,000. The machinery was damaged to about \$15,000. The company was working on a contract for shell boxes for munitions. The plant will be rebuilt immediately and require new machinery. L. A. Delaplante is general manager.

The Dalhousie Lumber Co., Dalhousie, N. B., will build an addition to its mill. W. H. Priest, resident manager, is in the market for fire extinguishers, steam engines, shafting, belting, pulleys, feed pump, boilers, sprinklers, motors, etc.

Plans have been prepared for the erection of a two-story addition to the plant of the Three Rivers Shipyard, Ltd., Three Rivers, Que. The company is in the market for band saws, common, band saws working on tables at an angle of 45 deg. on right and left, large planers, punching machinery, etc. John Bourgeois, 144 St. Francois Xavier, is engineer.

William Kragh will erect a three-story factory and a one-story power house at Winnipeg, to cost about \$60,000. James Chisholm & Son, 807 Great West Permanent Building, are the architects.

The Halifax Shipyards, Ltd., Barrington Street, Halifax, N. S., has let the general contract for the erection of a one-story machine shop to cost \$55,000, to the Bedford Construction Co., Bank of Commerce Building. Construction will commence immediately.

The Turnbull Elevator Mfg. Co., 126 John Street, Toronto, will build an addition to its boiler house to cost \$6,000.

Ker & Goodwin, 256 Colborne Street, Brantford, Ont., will start work immediately on the erection of a munition factory to cost \$35,000. A. Goodwin is manager.

The Department of Public Works, Ottawa, Ont., will shortly embark on an extensive shipbuilding program at Nanaimo, B. C., costing \$15,000,000. R. C. Desrochers, Ottawa, is secretary.

The Canadian Car & Foundry Co., Laughton Avenue, Fort William, Ont., has been awarded contract for the construction of 25 steel vessels for the United States Government.

The Oliver Motors, Ltd., Montreal, has been incorporated with a capital stock of \$20,000 by C. J. Ogden, L. J. L'Heureux and others to manufacture automobiles, motors, machinery, etc.

Norman Taber, 444 Bathurst Street, Toronto, is in the market for a 50-hp. automatic high-speed steam engine.

The Utility Electric Mfg. Co., Welland, Ont., is in the market for an electric spot welder.

The Beach Foundry Co., Ottawa, Ont., is having plans prepared for additions to its plant to cost \$75,000.

The Tidewater Shipbuilding Co., Three Rivers, Que., proposes to build marine engines and boilers at its shipyards and is installing buildings at its yards at a cost of about \$500,000.

## Government Purchases

WASHINGTON, Oct. 7.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, on date not set, as follows: Schedule 1970, one 1½ in. diameter upright drill, one emery grinder, one 16-in. engine lathe, one lever punch, one lever shear, one wood trimmer, one 15-in. stroke shaper, all for Puget Sound.

## NEW TRADE PUBLICATIONS

**Magnet Operated Brakes.**—Cutler-Hammer Mfg. Co., Milwaukee. Booklet G. Relates to an improved form of magnet-operated brake for direct-current service. Among the changes that have been made are the lowering of the magnet and making the magnet armature an integral part of one of the arms carrying the brakeshoes with a resulting simplification of construction, fewer parts and these of stronger construction are employed and compactness has been secured. Rating and dimension tables of the standard sizes, which vary from 8 to 30 in. in diameter and 15 to 300 hp. in capacity and are intended for use on cranes, hoists or bridges, are given, and illustrations of the brakes are included.

**Rivet Cutting Gun.**—Rivet Cutting Gun Co., 220 East Second Street, Cincinnati. Book No. 2. Presents illustrations and brief descriptions of a number of applications of a rivet cutting gun designed as a substitute for a sledge and cutting tool in removing rivets in railroads and boiler shops, on ships, dismantling structural steel work, cutting concrete and brick work and for breaking out slag pockets in steel mills. An illustrated description of the gun appeared in THE IRON AGE, Dec. 27, 1917.

**Force Feed Lubricators.**—Inter-State Machine Products Co., Inc., Rochester, N. Y. Bulletin No. 130. Describes a force feed lubricator for lubricating the valves, cylinders and bearings of engines, pumps, air compressors and similar units. The special feature upon which emphasis is laid in the description of the lubricator is the fact that each pumping unit is entirely independent of the others and may be removed from the reservoir with the cover without disturbing any adjustment or removing any other parts of the lubricator. The text description of the construction of the lubricator is supplemented by engravings of the various parts of the lubricator as well as the different styles that can be furnished.

**Metal Cutting Saws and Machines.**—E. C. Atkins & Co., Indianapolis. Three booklets. The first gives illustrations and tables of sizes of the various types of circular metal cutting saws that can be supplied. The second which is designed to be hung in the stockroom contains information covering the uses for which the company's hand and power hack saw blades are best suited. The different number of blades are arranged in numerical order with a brief statement of the work for which they are adapted, the width, the thickness and the number of teeth per inch and tables of the different sizes that can be supplied. The third booklet relates to the Kwick-Kut line of metal cutting machines. A brief general description of the machine is first presented followed by details of its construction and illustrations of the various parts. Illustrations and condensed specification tables of the different sizes of machines that can be supplied are included.

**Return Tubular Boiler.**—Uniflow Boiler Co., Inc., Harrison Building, Philadelphia. In the review of this company's Bulletin No. 18 in the issue of Sept. 5, page 605, it was incorrectly stated that the Bulletin covers particulars of a water-tube boiler when the company makes instead a return tubular boiler.

**Grinding Wheels and Machinery.**—L. Best Co., 75 Barclay Street, New York. Catalog. Concerned with a line of grinding wheels and machinery which includes wheels of the cup, cylinder and taper side types and bench, tool and swinging frame machines. Illustrations and brief descriptions of the different machines and directions for ordering and mounting the wheels are presented.

**Welding and Cutting Equipment.**—General Welding & Equipment Co., 107 Massachusetts Avenue, Boston. Booklet. Concerned with the various types of cutting and welding torches that can be supplied for use with the oxy-acetylene process and the different regulators. The construction of the torches and regulators is gone into at some length, the text being supplemented by both line and halftone engravings.

**Oxygen and Hydrogen Generators.**—International Oxygen Co., 115 Broadway, New York. Catalog No. 4. Relates to an improved type of electrolytic generator for oxygen and hydrogen. Illustrations and dimension and capacity tables supplement the text description, and the compactness of the generator is brought out by two typical plant layouts.

**Storage Battery Industrial Trucks.**—C. W. Hunt Co., Inc., West New Brighton, N. Y. Bulletin No. 18-2. Concerned with a line of industrial trucks, tractors and trailers operated by storage batteries. Standard and special types equipped with side and end dumping bodies are illustrated, and condensed specification tables are included.



ESTABLISHED

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